UNIVERSIDADE DE LISBOA

FACULDADE DE MEDICINA DE LISBOA

Pro-Ana Websites and its Impact on the Quality of Life of Anorexic Patients

Fernanda Araújo Rios Bastos

Orientador: Professor Doutor Daniel Sampaio

Co-Orientadora: Professora Doutora Ana Rita Vaz

Dissertação especialmente elaborada para a obtenção do grau de Mestre em Doenças Metabólicas e Comportamento Alimentar

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ANAD- National Association of Anorexia Nervosa and Associated Disorders

APA- American Psychiatric Association

BED- binge eating disorder

BMI- Body Mass Index

BSQ- Body Shape Questionnaire

BT- Behavioral therapy

CAT- Cognitive analytic therapy

CBT- Cognitive behavioral therapy

CI- Confidence Interval

CIA- Clinical Impairment Assessment

DSM- Diagnostic and Statistical Manual of Mental Disorders

EDE-Q- Eating Disorder Examination Questionnaire

EDNOS- Eating disorder not otherwise specified

E.g. - For example

H- Hypothesis

ICD- International Classification of Diseases

Kcal- Kilocalorie

Pro- ED- Pro-eating disorder

RSES- Rosenberg Self-Esteem Scale

SD- Standard Deviation

SPSS- Statistical Package for the Social Sciences

SSRIs- Selective Serotonin Reuptake Inhibitors

TCA- Tricyclic Antidepressant

WHO- World Health Organization

WHOQOL- World Health Organization Quality of Life

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ABSTRACT

Pro-ana websites have been growing in number and popularity. These websites promote anorexia nervosa as a lifestyle rather than a disease. Consequently, it tends to negatively affect the quality of life of visitors. Aiming to better understand the associations between pro-ana website usage and the quality of life of anorexic patients, the goal of this study was to identify a path of influence between pro-ana website usage and the quality of life of visitors. Hence, this study proposed the following model (Pro-Ana Website Usage → Dietary Restraint → Body Dissatisfaction → Self-Esteem → Quality of Life). Another goal of this study was to compare patients who visit pro-ana websites to patients who do not visit it, regarding different psychological variables as quality of life, eating disordered behaviors, body dissatisfaction, psychosocial impairment and self-esteem. Fifty Portuguese female anorexic patients participated in this study. In order to collect data, it was used a demographic and clinical questionnaire and 5 other scales (WHOQOL-BREF, RSES, BSQ, CIA and EDE-Q). Our results showed that body dissatisfaction, psychosocial impairment and eating disordered behaviors levels were higher for patients who visit pro-ana websites compared to patients who do not visit it. In addition, quality of life was lower for patients who visit pro-ana websites compared to patients who do not visit it. Regarding self-esteem, our results showed no significant difference between the 2 groups of patients. Besides that, our study found that the indirect effect of pro-ana website usage on quality of life passes through dietary restraint, body dissatisfaction and self-esteem. In conclusion, our findings suggest that the use of pro-ana websites is related to higher levels of body dissatisfaction, psychosocial impairment and eating disordered behaviors, and to lower levels of quality of life. Furthermore, the hypothesized model was supported by our findings, which shows that the use of pro-ana websites is positively associated with dietary restraint, which is positively associated with body dissatisfaction, which in turn is negatively associated with self-esteem, which is positively associated with quality of life. Perhaps, the most significant contribution of this study is the proposition of a new significant model that shows a path of influence. However, I do not claim that this is the only possible path of influence. There may be other variables associated with this process that we have not tested on our study.

Keywords: Anorexia Nervosa, Pro-Ana Websites, Quality of Life

RESUMO

A anorexia nervosa é um transtorno alimentar grave que afeta o corpo e a mente. Ela é caracterizada por perda de peso intencional, preocupação constante com o peso, a forma corporal e a comida, além de alterações na imagem corporal (Walsh, 2013). A anorexia nervosa é uma doença caracteristicamente privada e secreta. Geralmente, indivíduos anoréxicos sofrem sozinhos, lutando para controlar seu corpo através da obsessão sobre o que ingerem (Dolan, 2003). Esta doença afeta 0,3-3% das mulheres e é uma das doenças crônicas mais prevalentes em adolescentes do sexo feminino em todo o mundo (Hoek van & Hoeken, 2003). Ela também é uma das dez principais causas de incapacidade das jovens do sexo feminino e tem uma das mais altas taxas de mortalidade entre todos os transtornos psiquiátricos (Mathers, Vos, Stevenson, & Begg, 2000; Sullivan, 1995).

Atualmente, existe uma grande conexão entre a anorexia nervosa e o uso da internet. A internet pode ser uma legítima fonte de informação relacionada à promoção da saúde, embora possa também ser utilizada como uma ferramenta para a troca de informações errôneas e promoção de comportamentos não-saudáveis (Finfgeld, 2000; Johnsen, Rosenvinge, & Gammon, 2002). Particularmente preocupantes são os websites pro-anorexia (pro-ana). Fatores como a fácil acessibilidade da internet e a crescente taxa de prevalência da anorexia nervosa podem ser fortes contribuintes para a existência e popularidade desse movimento pro-ana. Websites pro-ana promovem a anorexia nervosa como um estilo de vida ao invés de reconhecerem-na como uma doença, potencialmente fazendo-a parecer menos grave para os visitantes desses sites (Peebles et al, 2012;. Wilson, Peebles, Hardy, & Litt, 2006). Websites pro-ana permitem que os seus visitantes falem livremente e compartilhem suas experiências com um senso de segurança pessoal (Mulveen & Hepworth, 2006). Consequentemente, eles promovem uma comunidade de apoio e incentivo para os seus visitantes, encorajando-os a manter a sua doença e a perder ainda mais peso, permitindo assim a perpetuação da anorexia nervosa na ausência de tratamento (Dolan, 2003).

Evidências crescentes indicam que o uso de websites pro-ana tende a afetar negativamente os seus visitantes em muitos aspectos de suas vidas, como: satisfação corporal (Harper, Sperry, & Thompson, 2008); qualidade de vida (Peebles et al., 2012); duração do tratamento (Wilson, Peebles, Hardy, & Litt, 2006); frequência das hospitalizações (Wilson et al.,

2006); ingestão calórica (Jett, LaPorte, & Wanchisn, 2010); níveis de perfeccionismo (Custers & Van den Bulck, 2009); e auto-estima (Bardone-Cone & Cass, 2007). Embora estes estudos tenham aumentado nossa compreensão relacionada às consequências da utilização de websites pro-ana, nós ainda conhecemos pouco sobre as associações entre o uso de websites pro-ana e a qualidade de vida dos seus visitantes.

Visando compreender melhor estas associações, o objetivo deste estudo foi identificar um caminho de influência entre o uso de websites pro-ana e a qualidade de vida dos seus visitantes. Assim, este estudo propôs o seguinte modelo (Uso do Websites Pro-Ana → Restrição Dietética → Insatisfação Corporal → Auto-Estima → Qualidade de Vida). Outro objetivo deste estudo foi comparar as pacientes que visitam websites pro-ana com as pacientes que não visitam, em relação a diferentes variáveis psicológicas (insatisfação corporal, auto-estima, qualidade de vida, comprometimento psicossocial e comportamentos alimentares desordenados). As participantes deste estudo foram 50 pacientes Portuguesas, anoréxicas, do sexo feminino (com media de idade de 23,72 (SD= 11,21) Min=14/ Max=61). Para coletar os dados, foram utilizados um questionário sócio-demográfico e clínico e 5 outras escalas: WHOQOL-BREF (para medir a qualidade de vida), RSES (para medir a auto-estima), BSQ (para medir a insatisfação com o corpo), CIA (para medir o comprometimento psicossocial) e EDE-Q (para medir os comportamentos alimentares desordenados). ANCOVA análises foram conduzidas para comparar as médias entre os grupos e uma análise de mediação foi realizada para testar o modelo proposto no presente estudo.

Nossos resultados mostraram que as razões mais relacionadas à utilização de websites pro-ana foram: (1) aprender novas técnicas para perder peso (40%), (2) procurar motivação para perder peso (25%), e (3) procurar apoio emocional (25%). Além disso, nossos resultados mostraram que as diferenças entre os níveis de insatisfação corporal (p = 0,017), comprometimento psicossocial (p = 0,001), comportamentos alimentares desordenados (total) (p = 0,003), preocupação com o peso (p = 0,005), preocupação com a forma (p = 0,009) e preocupação com a comida (p = 0,001) foram significativamente maiores para as pacientes que visitam websites pro-ana em comparação com as pacientes que não visitam. O nível de restrição dietética (p = 0,064) foi marginalmente significativamente maior para as pacientes que visitam websites pro-ana em comparação com as pacientes que não visitam esses sites. Por outro lado, o nível de qualidade de vida (p = 0,089) foi marginalmente significativamente maior para as pacientes que não utilizam websites pro-ana em comparação com as pacientes que

utilizam esses sites. A diferença entre os níveis de auto-estima entre os 2 grupos de pacientes não foi significativa (p = 0,125).

Consistente com os nossos resultados, Wilson et al. (2006) afirmou que o uso de websites pro-ana é um mecanismo provável de agravamento dos transtornos alimentares entre os seus visitantes. Além disso, investigações recentes têm encontrado apoio para o fato de que visitar websites pro-ana está relacionado a níveis significativamente mais elevados de insatisfação corporal do que visitar websites pro-recuperação (Harper et al., 2008). Ainda, um estudo recente que verificou a correlação entre o uso de websites pro-ana e a qualidade de vida dos seus visitantes mostrou uma clara associação entre o nível de uso de websites pro-ana e a baixa qualidade de vida dos seus visitantes (Peebles et al., 2012). Pesquisadores também afirmam que esse tipo de websites estimulam e reforçam comportamentos alimentares desordenados, como a restrição dietética (Jett et al., 2010).

Nosso estudo também identificou um caminho de influência— o efeito indireto do uso de websites pro-ana na qualidade de vida dos seus visitantes através de restrição dietética, insatisfação corporal e auto-estima. Os resultados da análise de mediação revelaram que: (1) o uso de websites pro-ana está positivamente associado à restrição dietética (β = .91, SE =.50, t = 1.80, p = 0,07); (2) a restrição dietética está positivamente associada à insatisfação corporal (β = .44, SE = .09, t = 4.9, p < 0,001); (3) a insatisfação corporal está negativamente associada à auto-estima (β = -.42, SE = .09 , t = -4.7, p < 0,001); e (4) a auto-estima está positivamente associada à qualidade de vida (β = .56, SE = .12, t = 4.6, p < 0,001). Esta analise foi realizada controlando as seguintes variáveis: idade, IMC, duração da doença e duração do tratamento.

Em conclusão, os nossos resultados sugerem que o uso de websites pro-ana está relacionado a maiores níveis de insatisfação corporal, comprometimento psicossocial e comportamentos alimentares desordenados (restrição dietética, preocupação com o peso, preocupação com a forma e preocupação com a comida). Nossos resultados ainda mostraram que as pacientes que visitam websites pro-ana têm níveis mais baixos de qualidade de vida em comparação às pacientes que não visitam esses websites. Além disso, nossos resultados apoiam o modelo proposto, o qual mostra que o uso de websites pro-ana está positivamente associado à restrição dietética, a qual que está positivamente associada à insatisfação corporal, a qual por sua vez está negativamente associada à auto-estima, a qual está positivamente associada à qualidade de vida.

O conhecimento gerado através deste estudo pode ser útil para o avanço da teoria existente. Além disso, ele também pode orientar os profissionais de saúde sobre o planejamento do tratamento dos pacientes com anorexia nervosa. Por exemplo, o uso de websites pro-ana deveria ser abordado na fase inicial do planejamento do tratamento e incorporado na tomada de decisões. Para visitantes de websites pro-ana, este trabalho tem um propósito informativo, alertando-os sobre os efeitos negativos relacionados ao uso desses websites.

Apesar dos progressos feitos através deste estudo, há espaço para futuros estudos, com um design longitudinal, para investigar se as variáveis testadas em nosso estudo são mediadores do efeito do uso de websites pro-ana na qualidade de vida dos seus visitantes. Estudos futuros podem também testar se a qualidade de vida de diferentes grupos de visitantes varia de acordo com o número de horas que estes gastam visitando websites pro-ana. Além disso, eles podem investigar se o uso de websites pro-ana afeta os seus visitantes em outros aspectos para além da qualidade vida, por exemplo na duração do tratamento da anorexia nervosa.

Palavras-Chave: Anorexia Nervosa, Websites Pro-Ana, Qualidade de Vida

CHAPTER I:

ANOREXIA NERVOSA

The first known description in the medical literature of anorexia nervosa is from 1689. Richard Morton, a physician, described in his book two cases of “nervous consumption”, what we now call anorexia nervosa. However, the disorder only received its present name in the late 19th century (David Garner, Vitousek, & Pike, 1997).

In the 19th century, anorexia nervosa was introduced as a new illness by the British psychiatrist William Gull (1874, 1888) and the French physician Charles Lasègue (1873). Both of them characterized anorexia nervosa as a “nervous” disease. However, Gull focused more on biological processes, whereas Lasèque focused more on psychosocial and psychological roots (Ruth H Striegel-Moore & Bulik, 2007).

It has also been speculated that some female medieval saints may have suffered with this disorder. Documentation from the Middle Ages indicates that they used to fast to achieve purity (Bell, 1985; Pearce, 2004). One such saint was Catherine of Siena. She led a life of extraordinary asceticism. The most prominent feature of her asceticism was her self-starvation. Catherine regarded her inability to eat both as a punishment from God for her sins, and as a mean for her expiation. Although her body was very skinny, Catherine frequently displayed the hyperactivity that is commonly displayed by anorexics (Griffin & Berry, 2003).

Although the medical facts of anorexia nervosa have been documented since the 1870s, it was not until 1980 that body image disturbance was formally included as a diagnostic criterion in the Diagnostic and Statistical Manual of Mental Disorders published by the American Psychiatric Association (Hopton, 2011). Nowadays, anorexia nervosa is a well characterized biologically-based mental disorder (Walsh, 2013).

1- Definition

Anorexia nervosa is a severe eating disorder that affects body and mind. It is characterized by deliberate weight loss and, in a significant fraction of individuals, by engagement in excessive physical activity. Moreover, it is characterized by a constant concern with body weight/shape and food, intense fear related to a possible weight gain and alterations in body image (Walsh, 2013). In addition, there is undernutrition with secondary endocrine and

metabolic changes, and disturbances of body functions (Bulik, Reba, Siega-Riz, & Reichborn-Kjennerud, 2005).

Anorexic individuals are unable to maintain a healthy body weight and, despite apparent cachexia, they remain obsessed with losing weight. Life for anorexic individuals becomes a devastating obsession with eating and weight (Bulik et al., 2005).

Anorexia nervosa occurs most commonly in adolescent girls and young women, and its peak age of onset is between 15 and 19 years old. However, it can also affect adolescent boys and young men, as also children approaching puberty and older women (WHO, 1992).

There are two subtypes of anorexia nervosa. The classification depends on how individuals with anorexia control their weight.

Restricting Type: individuals lose weight primarily through dieting, fasting or excessive exercising (several hours per day). They severely restrict their calories (300 to 700 kcal/day) by consuming a limited variety of foods that are low in energy density or sometimes just water. Anorexic individuals with the restricting type do not lose their appetites. They still experience hunger but ignore it (Videbeck, 2014).

Binge-Eating/Purging Type: it is one of the most dangerous forms of an eating disorder. It is characterized by binge behaviors followed by purging behaviors. Purging involves compensatory behaviors designed to eliminate food (e.g., vomiting, laxatives, diuretics, enemas, appetite suppressants, etc.). Even if individuals with anorexia do not binge, they can still engage in purging behaviors after ingesting small amounts of food (Videbeck, 2014).

Table 1- Symptoms of Anorexia Nervosa

Symptoms of Anorexia Nervosa
Fear of gaining weight or becoming fat even when severely underweight
Body image disturbance
Amenorrhea
Depressive symptoms such as depressed mood, social withdrawal, irritability, and insomnia
Preoccupation with thoughts of food
Feelings of ineffectiveness
Inflexible thinking
Strong need to control environment
Limited spontaneity and overly restrained emotional expression
Complaints of constipation and abdominal pain
Cold intolerance
Lethargy
Emaciation
Hypotension, hypothermia, and bradycardia
Hypertrophy of salivary glands
Elevated BUN (blood urea nitrogen)
Electrolyte imbalances
Leukopenia and mild anemia
Elevated liver function

Adapted from Videbeck, 2014.

Aside from its physical manifestations, anorexia nervosa is a characteristically private and secretive disease. Anorexic individuals suffer alone, fighting to control their body by obsessing about what they put into it (Dolan, 2003). Their personality is characterized by perfectionism, obsession, anxiety, low self-esteem, neuroticism, harm avoidance, low self-directedness, low cooperativeness, and traits associated with avoidant personality disorder (Bardone-Cone et al., 2007; Videbeck, 2014).

Anorexic individuals often perceive themselves as helpless, powerless, and ineffective. They see themselves only in terms of their ability to control their food intake and weight. They consider other personal characteristics or achievements less important than thinness.

Furthermore, this disorder also interferes with their ability to have satisfying relationships. Commonly, anorexic individuals withdraw from peers and pay little attention to friendships. It happens as a result of their beliefs. They think that others will not understand what they go through, and also fear that they will begin eating too much while in the presence of other people (Videbeck, 2014).

Frequently, other psychiatric conditions coexist with anorexia nervosa, including major depression in 50-75% of patients (K A Halmi et al., 1991), anxiety disorders in 60% of patients (Walter H Kaye, Bulik, Thornton, Barbarich, & Masters, 2004), obsessive–compulsive disorder in 40% of patients (Walter H Kaye et al., 2004), and alcohol/substance abuse in 12-27% of patients (Bulik et al., 2004; K A Halmi et al., 1991).

2- Diagnostic Criteria

The diagnosis of anorexia nervosa is made on the basis of history taking (including information from family members, friends, and teachers). The patient's history reveals overvaluation of thinness, abnormal food restriction, compulsive exercise, and sometimes binging and purging. On the basis of a physical examination it reveals excessive thinness and purging habits. Purging is suggested by enlargement of the salivary glands, eroded dental enamel, and scars on the dorsum of the hands from repeated, self-induced vomiting. Meeting the criteria from one of the diagnostic criteria manuals (e.g. Diagnostic and Statistical Manual of Mental Disorders - DSM or International Classification of Diseases - ICD), establishes the diagnosis of anorexia nervosa. No specific laboratory tests confirm the diagnosis (Yager & Andersen, 2005).

2.1- DSM

The DSM is a publication of the American Psychiatric Association (APA) who are a society of psychiatric physicians. The APA created the DSM, which contains sets of diagnostic criteria grouped into categories (disorders) to assist clinicians with effective diagnoses and care of people with mental health disorders (“DSM-5,” 2014). In sum, the DSM is a clinical

classificatory scheme designed to facilitate clinical work (APA, 1994). There are several diagnostic criteria manuals used worldwide, but the DSM is the one used most commonly used.

DSM-IV

The DSM–IV recognizes two eating disorders in adults, anorexia nervosa and bulimia nervosa. In addition, there is an 'eating disorder not otherwise specified' (EDNOS) diagnosis reserved for eating disorders of clinical severity that do not meet the diagnostic criteria for anorexia nervosa or bulimia nervosa.

According to the DSM-IV (APA, 1994), anorexia nervosa is characterized by 4 main signs and symptoms:

- Refusal to maintain weight at or above normal for age and height value;
- Intense fear of gaining weight or becoming obese/fat, even when abnormally thin;
- Overestimation of the weight or shape, despite the loss of weight or low weight;
- In women and female teenagers, the absence of at least three consecutive menstrual cycles;

DSM-5

Nowadays, we know that eating disorders in adults are far more varied and variable than the DSM-IV scheme suggests. One of the major classificatory problems that exist in the DSM-IV eating disorders criteria is that the inordinate percentage of individuals who present for treatment do not fulfill the threshold criteria for the two major eating disorders anorexia nervosa and bulimia nervosa (Hebebrand & Bulik, 2011). As a consequence, the majority of individuals with eating disorders are classified under the diagnostic label of eating disorders not otherwise specified (EDNOS) (Fairburn & Cooper, 2011; Fairburn et al., 2007; Ricca et al., 2001).

The opportunity to revise diagnostic criteria in psychiatry occurs on average once per 10–20 years and the impact of diagnostic modifications is far-reaching. The first draft of the DSM-5 criteria was published online in February 2010. In May 2013, the Fifth Edition of the Diagnostic and Statistical Manual of Mental Disorders (DSM-5) was released at the American Psychiatric Association's Annual Meeting. It marked the end of a journey of more than a decade revising the criteria for the diagnosis and classification of mental disorders (Hebebrand & Bulik, 2011).

The DMS-5 was an opportunity for those developing it to think over again about the classification of the eating disorders and remodel the diagnostic scheme. Thus, contributing in such a way that the DSM-5 accurately represents clinical reality and is of value to clinicians (Fairburn & Cooper, 2011).

Many changes were proposed to the DSM-5. These changes were based on reviews of the extant literature published within special issues of the International Journal of Eating Disorders. The least extreme was to loosen the diagnostic criteria for anorexia nervosa and bulimia nervosa. The most radical one was to recognize binge eating disorder (BED) as a third eating disorder, thus extracting these cases from the EDNOS (Fairburn & Cooper, 2011). Other change proposed was to expand further the DSM-IV definitions of anorexia nervosa, bulimia nervosa and binge eating disorder (Walsh & Sysko, 2009).

One study compared the DSM-IV diagnostic criteria with those proposed for the DSM-5 on number of EDNOS cases. Results of this study indicated that proposed revisions to the diagnostic criteria for anorexia nervosa, and the addition of BED as a separate diagnostic category will reduce the use of EDNOS cases (Keel, Brown, Holm-Denoma, & Bodell, 2011).

Regarding anorexia nervosa, several minor but important changes were made in the DSM-5. First, Criterion A focus on behaviors, like restricting calorie intake, and no longer includes the word "refusal" in terms of weight maintenance since that implies intention on the part of the patient and can be difficult to assess. Second, the DSM-IV criterion requiring amenorrhea, or the absence of at least three menstrual cycles, was deleted. This criterion cannot be applied to males, pre-menarchal females, females taking oral contraceptives and post-menopausal females. In some cases, individuals exhibit all other symptoms and signs of anorexia nervosa but still report some menstrual activity." Besides, that, many authors suggest that amenorrhea in anorexia nervosa largely reflects nutritional status, suggesting that

amenorrhea is a consequence of anorexia, similar to changes in blood pressure, body temperature, and bone mineral density, rather than a core feature of the syndrome (Attia & Roberto, 2009; Watson & Andersen, 2003).

Table 2- Diagnostic Criteria for Anorexia- DSM-5 Changes

Diagnostic Criteria for Anorexia Nervosa- DSM-5 Changes
The requirement for amenorrhea has been eliminated
The wording of the Criterion A has been changed for clarity, and guidance regarding how to judge whether and individual is at or below a significantly low weight- "*significantly low body weight*" replaces "*below 85% of expected*"
Criterion B is expanded to include not only overtly expresses fear of weight gain but also persistent behavior that interferes with weight gain.

Adapted from "Highlights of Changes from DSM-IV-TR to DSM-5," 2013.

2.2- ICD-10

According to the ICD-10 (International Classification of Diseases) ("WHO | The WHO Health Promotion Glossary," n.d.), the diagnosis of anorexia nervosa is done according to the following criteria:

- Body weight is maintained at least 15% below the minimally normal weight for age and height expected (either lost or never achieved);
- Weight loss is self-induced by the refusal of "fat foods";
- Distortion in body image, in the form of a specific psychopathology, characterized by a dread of fatness;
- Widespread endocrine disorder involving the hypothalamic pituitary-gonadal axis, manifest in women as amenorrhea and in men as loss of sexual interest and potency;
- Body Mass Index (BMI) lower than 17.5.

Table 3 compares the diagnostic criteria from the DSM-IV and the ICD—10.

Table 3- Comparison of Diagnostic Criteria for Anorexia Nervosa: DSM-IV and ICD-10

	DSM-IV	ICD-10
Code	**307.1**	**F50.0**
Weight	—Refusal to maintain body weight at or above minimally normal weight for age and height (e.g., weight loss leading to maintenance of body weight < 85% of expected weight) **OR** —Failure to make expected weight gain during growth period, leading to weight < 85% of expected normal body weight	—Body weight is maintained at least 15% below that expected (either lost or never achieved) —Quetelet's body-mass index is 17.5 kg/m2 or less **OR** —Prepubertal patients may show failure to make the expected weight gain during the period of growth
Phobia/ Associated Behaviors	—Intense fear of gaining weight or becoming fat, even though underweight *DSM-IV behaviorally differentiates between types: **Restricting =** not engaging in binge-eating or purging behavior **Binge-eating/purging =** regularly engaging in binging or purging behavior	—Weight loss self-induced by avoidance of ''fattening foods'' **AND** —One or more of the following: self-induced vomiting; self-induced purging; excessive exercise; use of appetite suppressants and/or diuretics
Body	—Disturbance in the way in which one's body weight and shape are experienced —Undue influence of body weight or shape on self-evaluation **OR** —Denial of the seriousness of the current low body weight perception	—Body-image distortion in the form of a specific psychopathology whereby a dread of fatness persists as an intrusive, overvalued idea **AND** —Patient imposes a low weight threshold on himself or herself
Amenorrhea/ Hormonal Fluctuations	—In postmenarcheal females, amenorrhea, i.e., the absence of at least three consecutive menstrual cycles (amenorrhea exists if periods occur only via hormone induction)	—In women, amenorrhea, and in men, loss of sexual interest and potency (an apparent exception is the persistence of vaginal bleeds in anorexic women who are receiving replacement hormonal therapy, most commonly taken as a contraceptive pill) —There may also be elevated levels of growth hormone, raised levels of cortisol, changes in the peripheral metabolism of the thyroid hormone, and abnormalities of insulin secretion

Pubertal Development	Not specified	—With prepubertal onset, the sequence of pubertal events is delayed or even arrested (growth ceases; in girls, the breasts do not develop and there is a primary amenorrhea; in boys, the genitals remain juvenile); with recovery, puberty is often completed normally, but the menarche is late

Adapted from Walsh, 2013.

2.3- Laboratory Tests

Table 4 summarizes the initial laboratory tests recommended to assess the physiological effect of anorexia nervosa.

Table 4- Recommended Laboratory Studies in Patients with Anorexia Nervosa

Routine Studies
• Complete blood count • Urinalysis • Measurement of serum electrolytes; levels of creatinine, thyrotropin, and phosphorus; and fasting glucose values
Studies to Consider for Selected Patients
• Measurement of the level of serum amylase - for patients suspected of surreptitious vomiting • Measurement of serum calcium and magnesium levels and liver-function tests - for patients with weight below 75 percent of the expected weight • Electrocardiogram -before initiation of atypical antipsychotic medications • Dual-energy x-ray absorptiometry of bone - for patients who have been underweight for longer than six months • Magnetic resonance imaging or computed tomography of the brain and neuropsychological assessment - for patients with atypical features, such as hallucinations, delusions, delirium, and persistent cognitive impairment, despite weight restoration

Adapted from American Psychiatric Association, 2000.

3- Etiology

There is no specific cause for anorexia nervosa, since it is a disorder with multifactorial causes (biological, family and cultural). It means that its development can occur in different ways for different individuals (David Garner et al., 1997). The lifetime risk for anorexia nervosa among women is estimated to be 0.3 to 1 percent and among men a 10th of that rate (Hoek & van Hoeken, 2003).

Researchers affirm that dieting may be one of the main stimulus that leads to the development of anorexia nervosa (Videbeck, 2014). Cognitive behavioral theories propose that the restriction of food intake that characterizes the onset of many eating disorders has two main origins. The first is a need to feel in control of life, which gets displaced onto controlling eating. The second is overvaluation of shape and weight in those who have been sensitized to their appearance (Fairburn, Shafran, & Cooper, 1999).

For decades, the primary focus of risk-factor research has been sociocultural, developmental and familial on the etiology of eating disorders. However, studies over the past decade have focused on biological factors such as genetics and neonatal complications. Following, we will discuss some of these factors.

Table 5- Risk Factors for Anorexia Nervosa

General Factors	Sociocultural Risk Factors	Developmental Risk Factors	Family Risk Factors	Biologic Risk Factors
Female	Cultural ideal of being thin; media focus on beauty, thinness and fitness	Issues of developing autonomy and having control over self and environment	Adverse parenting (family lack of emotional support, parental maltreatment, low contact and high expectations)	Heredity
Adolescence and early adulthood	Preoccupation with achieving the ideal body	Dissatisfaction with body image	Family Dieting	Birth and neonatal complications
Living in a Western society	High social class	Premorbid experience: sexual abuse	Family history of: -Eating disorder -Depression -Obesity	Obesity
	Male homosexuality		Critical comments about eating, shape, or weight from family and others	Dieting at an early age

Adapted from Fairburn, Cooper, Doll, & Welch, 1999; Fairburn & Harrison, 2003; Videbeck, 2014.

3.1- Sociocultural Factors

We live in a culture that values thinness, with pressing cultural norms for women to consume, to be thin/beautiful, to be disciplined and to be good. Although, while societal pressures to be thin are increasing, our society is getting fatter. The media is filled with contradictions regarding women and food. Magazines are filled with articles about weight loss next to advertisements for fattening foods sold by extremely thin models. As a consequence, weight and the feminine ideal diverge, increasing the mental dissonance regarding food (Griffin & Berry, 2003).

Advertising plays a crucial role in this culture of consumption and is both a reflection of culture and a participant in the creation of culture. An average person sees 400 – 600 advertisements a day, and 1 in 11 of those has a direct message about beauty. Women in particular are inundated with these messages from the media, glorifying the virtues of dieting and thinness. Their role models for physical attractiveness are fashion models who are so thin that virtually do not represent any women in the actual population (David Garner et al., 1997; Griffin & Berry, 2003).

Sociocultural models of eating disorders have emphasized that this female beauty ideal of extreme thinness and objectification of the female body are risk factors for the development of eating disorders (Ruth H Striegel-Moore & Bulik, 2007).

Globalization has brought this thin female beauty ideal to ever larger numbers of cultures. Moreover, immigrants from cultures where this thin-body ideal is not prevalent may develop eating disorders as they assimilate the ideal. As a consequence, eating disorders ought to be expected to increase worldwide (APA, 1994; Catina & Joja, 2001).

To explain why only some girls or women develop an eating disorder in this cultural climate, individual characteristics have been proposed as risk factors for the development of eating disorders. These include social pressure to be thin, high social class, personality traits such as perfectionism, high social anxiety, elevated weight or obesity, high impulsivity, individual differences in biological response to starvation, and individual differences in the reward value of starvation or eating (R H Striegel-Moore, Silberstein, & Rodin, 1986; Ruth H Striegel-Moore & Bulik, 2007).

Studies show that minority women who are younger, better educated, and more closely identified with middle-class values are at increased risk for developing an eating disorder (Videbeck, 2014). Furthermore, researchers have found that homosexual males have higher levels of eating disturbance than heterosexual males (Lakkis, Ricciardelli, & Williams, 1999; Strong, Williamson, Netemeyer, & Geer, 2000). Homosexual males may be at elevated risk of developing eating disorders because of gay culture’s increased emphasis on physical appearance (Boroughs & Thompson, 2002).

3.2- Developmental Risk Factors

Adolescents struggle to develop autonomy and to stablish a unique identity. For this reason, some of them begin to control their eating through severe dieting and thus gain control over one aspect of their lives: weight (Videbeck, 2014).

Self-perceptions of the body can influence the development of identity in adolescence. Self-perceptions that include being overweight (body image disturbance) lead to the belief that dieting is necessary before one can be happy or satisfied. Body image disturbance is another risk factor to the development of anorexia nervosa (Videbeck, 2014).

3.3- Familial Risk Factors

Disordered eating is a common response to family problems. Adolescents growing up among family problems are at higher risk for anorexia nervosa. As a consequence of not having emotional support, they often try to escape their negative emotions focusing on something concrete, such as physical appearance (Videbeck, 2014).

The relative risk of anorexia nervosa in family members of males with anorexia is even higher than in women (Strober, Freeman, Lampert, Diamond, & Kaye, 2001). However, women with story of anorexia nervosa tend to maintain low BMIs even after recovery and, when pregnant, tend to give birth to lower birth-weight babies, potentially increasing their offspring's risk for anorexia nervosa (Cnattingius, Hultman, Dahl, & Sparén, 1999).

3.4- Biologic Risk Factors

Genetic Factors

Studies have shown that anorexia nervosa tends to run in families (L R Lilenfeld et al., 1998; Strober, Freeman, Lampert, Diamond, & Kaye, 2000). Additionally, there is evidence of familial coaggregation of anorexia nervosa and obsessional and perfectionist traits (Lisa R. Lilenfeld et al., 1998).

Most recent studies have focused on the extent to which genes most likely are involved in conferring vulnerability and their mechanism of influence. A study with 31,406 Swedish twins reported a heritability estimates of 56% from anorexia nervosa (Bulik et al., 2006). Other studies reported heritability of 48% (Kortegaard, Hoerder, Joergensen, Gillberg, & Kyvik, 2001) and 76% (Klump, Miller, Keel, McGue, & Iacono, 2001). The contribution of the shared environment was found to be negligible, and the remaining variance was primarily attributable to unique environmental factors. All of these studies point to a substantial contribution of additive genetic effects to anorexia nervosa.

In the first genome-wide linkage survey reported, a weak evidence for linkage in anorexia was noted, the highest non-parametric linkage score being (1.80) for a marker on chromosome 4 (Grice et al., 2002). A further analysis, which covaried for related behavioral traits, came up with a different locus on chromosome 1, as well as loci on chromosomes 2 and 13 (Devlin, 2002).

Neonatal Factors

Studies have shown that neonatal complications increase risk for anorexia nervosa. Studies have shown that babies born with cephalhematoma were at increased risk for developing anorexia nervosa later in life (Cnattingius et al., 1999; Favaro, Tenconi, & Santonastaso, 2006). In both studies, the authors suggested that pervasive brain damage at birth could result in early feeding difficulties and increased risk for anorexia nervosa.

Birth complications, such as low birth weight and preterm birth, are reportedly associated with increased risk of eating difficulties in childhood, which are thought to be predictive of anorexia nervosa in adolescence (Marchi & Cohen, 1990). In a study, a 3-fold increase in risk of developing anorexia nervosa was observed among girls born very preterm (before the 33rd week of gestation) (Cnattingius et al., 1999).

4- Epidemiology

Eating disorders are far more prevalent in industrialized societies, where food is abundant and beauty is linked with thinness. They are most common in countries like the United States, Canada, Europe, Australia, Japan, New Zealand, and South Africa (APA, 1994).

The incidence of anorexia nervosa is increasing (Eagles, Johnston, Hunter, Lobban, & Millar, 1995; Lucas, Beard, O'Fallon, & Kurland, 1991; Milos et al., 2004; Møller-Madsen & Nystrup, 1992). However, the results concerning the incidence of anorexia nervosa vary from study to study according to the population studied and the methods of diagnosis.

Anorexia nervosa affects 0.3–3% of women and is one of the most prevalent chronic disease in adolescent girls worldwide (Hoek & van Hoeken, 2003). In a study conducted in Portugal the prevalence of anorexia nervosa was 0.37% (Carmo & Reis, 2001).

Lifetime prevalence is defined as the proportion of people who have a specific disorder at any point in their life (Smink, van Hoeken, & Hoek, 2012). The lifetime prevalence rate of anorexia nervosa among women worldwide varies between 2% and 3% (Isomaa, Isomaa, Marttunen, Kaltiala-Heino, & Björkqvist, 2009).

5- Mortality

Anorexia nervosa is one of the ten leading causes of disability among young women and has one of the highest mortality rates among psychiatric disorders (Mathers, Vos, Stevenson, & Begg, 2000; Sullivan, 1995). However, many times the mortality rates reported on studies are underestimated. Part of the reason is because people who suffer from an eating disorder may die of other causes, such as malnutrition, heart failure, organ failure or suicide. Therefore, it is common that the medical complications of death are reported instead of the eating disorder that caused the death (Crow et al., 2009). For example, a recent meta-analysis revealed that approximately 20% of the deaths of anorexic patients are the result of suicide (Arcelus, Mitchell, Wales, & Nielsen, 2011). In another study, the main causes of death of anorexic patients were suicide, cancer, liver disease, hypoglycemia and pneumonia (C Laird Birmingham, Su, Hlynsky, Goldner, & Gao, 2005).

Patients with the binging-purging type of the disorder and also alcohol and substance abuse have a higher risk of premature death than do other patients with anorexia nervosa (Herzog et al., 2000). The American Psychiatric Association (APA) reported that 5% of patients with anorexia nervosa die within the first 4 years of diagnosis (APA, 1994).

Patients with anorexia nervosa have a mortality rate for all causes of death six times higher than the general population (Papadopoulos, Ekbom, Brandt, & Ekselius, 2009). A review of the standard mortality ratio in 10 cohort studies found that standard mortality rates in patients with anorexia nervosa are between 1.36 and 17.80 (Nielsen et al., 1998). In a most recent study, the standardized mortality ratio mortality rates were 5.9 (Arcelus et al., 2011).

6- Outcomes

Anorexia nervosa is a mental illness with serious course and outcome in many of the affected individuals. The range of outcomes associated to this disorder is wide. Among the few factors associated with a more favorable outcome are adolescent onset (in contrast to adult onset) and a shorter duration of the illness. The factors associated to poor outcomes are low body weights and long duration of the illness (H.-C. Steinhausen, 2002).

Early intervention appears to interrupt the increasingly restrictive dieting and growing social isolation in anorexic individual. However, in many of them, dieting and weight loss dominate mental life for years and severely impair physical health and social and occupational development (Walsh, 2013).

In adolescents, full recovery of weight, growth and development, menstruation, normal eating behavior and attitudes with regard to food, and body shape and body weight occurs in 50-70% of treated patients. A prospective study of adolescents who received comprehensive treatment found that 76% no longer had a diagnosable eating disorder at 10 years of follow-up (Strober, Freeman, & Morrell, 1999).

Anorexia nervosa in adults, including those only in their 20s, is generally much more resistant to intervention (Walsh, 2013). Therefore, outcomes are poorer among them. Only 33% of adult patients with anorexia nervosa are reported to recover fully (Herzog et al., 1999).

Older individuals with anorexia nervosa may exhibit substantial improvement in both physical and psychological symptoms through structured treatment programs. However, relapse rates after discharge are high (Kaplan et al., 2009).

Despite better recognition and more informed treatment approaches, the outcome of anorexia nervosa, particularly for adults, has probably not improved substantially in the past 50 years (H.-C. Steinhausen, 2002). Patients with anorexia nervosa have less than a 50% chance of recovery within 10 years and a 6.6 –15% risk of dying 10 – 20 years after the onset of the disorder (Bergh & Södersten, 1998).

Usually, there are comorbidities associated to anorexia nervosa (depression, anxiety disorder, phobias, and personality disorders). These comorbidities serve as risk factors contributing to a less favorable outcome of this disorder (Eckert, Halmi, Marchi, Grove, & Crosby, 1995; Herpertz-Dahlmann, Wewetzer, Schulz, & Remschmidt, 1996; H. C. Steinhausen & Seidel, 1993).

7- Clinical Complications

Eating disorders are accompanied by various clinical complications related to impaired nutrition status and inadequate compensatory practices to control weight (vomiting, use of diuretics, enemas and laxatives). It is known that patients who abuse laxatives are at a greater risk for these medical complications (Yager & Andersen, 2005).

These medical complications affect virtually every organ system. Moreover, many laboratory measures may also be affected, among them serum electrolyte levels and thyroid function. Many of these complications arise due the delay in diagnosis and initiation of treatment, since many patients try to hide their symptoms and/or refuse treatment (American Psychiatric Association, 2000; Key & Lacey, 2002). Among patients who have anorexia nervosa in adolescence, medical complications may persist into the adult years (Johnson, Cohen, Kasen, & Brook, 2002).

Some of the medical complications of anorexia nervosa are orthostatic hypotension, bradycardia, impaired menstrual function, hair loss, hypothermia, osteoporosis, cardiovascular

disturbances, diabetes mellitus, thyroid disorders, gastrointestinal problems, dental problems, fertility and pregnancy problems, and other psychiatric disorders (Herzog et al., 1999; Meczekalski, Podfigurna-Stopa, & Katulski, 2013).

Abnormalities in cognitive function may also occur. The brain loses both white and gray matter during severe weight loss as a result of semi-starvation; weight restoration results in the return of white matter to premorbid levels, but some loss of gray matter persists (Lambe, Katzman, Mikulis, Kennedy, & Zipursky, 1997).

Osteoporosis

Teenagers are at the critical period for achieving their peak bone mineral density (Schettler & Gustafson, 2004). Therefore, girls with the diagnosis of anorexia nervosa are at risk of attaining lower than normal peak bone mass and so of being at greater risk of osteoporosis and fractures later in life (Misra et al., 2004). It happens as a result of the profound influence of anorexia nervosa on bone metabolism.

Cardiovascular Disease

Cardiac complications appear in 80% of patients with eating disorders (Abuzeid & Glover, 2011). The most frequent cardiovascular disorder among patients with anorexia nervosa is sinus bradycardia (Portilla, 2011).

Gastrointestinal Problems

The functioning of the upper part of the gastrointestinal tract is disturbed in patients with anorexia nervosa (Robinson, 2000). Additionally, many severe metabolic disturbances can be seen in anorexic patients, such as electrolyte abnormalities. Besides that, in individuals who present the purge form of the disorder, hypokalemia, hypomagnesaemia and hypocalcemia are very common (Mitchell, Pyle, Eckert, Hatsukami, & Lentz, 1983).

Dental Problems

Anorexic patients who frequently vomit have many dental problems, such as loss of tooth enamel, chipped and ragged teeth, and dental caries (Videbeck, 2014).

Fertility and Pregnancy Problems

A range of neuroendocrine alterations occurs in anorexic patients. These alterations have both short and long-term consequences for reproductive health, such as fertility problems. Moreover, unplanned pregnancies and negative attitudes to pregnancy are also associated with a lifetime history of eating disorder (Easter, Treasure, & Micali, 2011).

Psychiatric Disorders

Psychiatric co-morbidities are very common in patients with eating disorders. Depression is the most common psychiatric disorder among patients with eating disorders. Also, a variety of anxiety disorders are seen in more than 60% of these patients. Additionally, social phobia and obsessive-compulsive disorder are common in anorexia nervosa (K A Halmi et al., 1991).

Mood disorders and substance misuse are others psychiatric comorbidities observed in patients with eating disorders (Krug et al., 2009). The prevalence of mood disorders in patients with anorexia nervosa varies from 31% to 88.9% (Katherine A Halmi et al., 2005).

Other clinical complications are shown in Table 6.

Table 6- Anorexia Nervosa Clinical Complications

	Clinical Complications	
Metabolic and Electrolyte	Hypokalemia	Hyponatremia
	Hypernatremia	Hypomagnesemia
	Hyperphosphatemia	Hypoglycemia
	Hypercholesterolemia	Metabolic alkalosis/ acidosis

Neurologic	Sulcal widening	Ventricular dilatation
	Brain atrophy (reversible)	
Ophthalmologic	Cataract	Optic nerve atrophy
	Retinal degeneration	Decreased of visual acuity
Endocrine	Euthyroid sick syndrome	Pseudo-cushing's syndrome
	Amenorrhea	Oligomenorrhea
	Decreased libido	Infertility
	Osteopenia or Osteoporosis	Delay of pubertal development
Gastrointestinal	Esophagitis	Hematemesis (S. Mallory-Weiss)
	Delayed gastric emptying	Reduced intestinal motility
	Constipation	Rectal prolapse
	Gastric dilatation	Abnormal liver function
	Hyperamylasemia	Hypertrophy of the parotid and submandibular glands
Renal	Kidney stones	Pre-renal azotemia
	Renal failure	
Bucomaxilares and Dermatologic	Dental Caries	Cheilosis
	Skin dryness	Cold and Pale skin
	Hypercarotenemia	Calluses on the fingers or the back of hands (Russel Sign)
	Acrocyanosis	
Pulmonary	Tachypnea	Bradypnea
	Pulmonary edema	Pneumomediastinum
Hematologic	Anemia	Leukopenia
	Thrombocytopenia	Neutropenia

Adapted from Assumpção & Cabral, 2002.

8- Treatment

Most anorexics are unwilling patients and firmly deny that they are ill. In the early stages of the disease, patients often deny they have a negative body image or anxiety towards their appearance. In addition, they are very pleased with their ability to control their weight and often express this. Consequently, they are resistant to treatment and would really prefer not to participate in it at all (Videbeck, 2014).

One of the mistaken ideas anorexic patients often hold is the expectation that the process of regaining weight would be almost irreversible. They also believe that their peers are jealous of their weight, and may believe that family and health care professionals are only trying to make them “fat and ugly”. This notion may increase their resistance to begin therapy. Thus, when anorexic individuals begin therapy, their initial posture is a defensive one rather than a collaborator (DM Garner & Bemis, 1982; Goldberg, Halmi, Casper, Eckert, & Davis, 1977).

Although, supportive relationships with partners, family members, therapists, or friends are perceived as the driving force in the recovery process. It is very important that the patient is the one who decides to be treated (Beresin, Gordon, & Herzog, 1989; Hsu, Crisp, & Callender, n.d.; Tozzi, Sullivan, Fear, McKenzie, & Bulik, 2003). Otherwise, if treatment is received for the benefit of others (i.e. other people have decided that the anorexic should have treatment), then the anorexic is unlikely to recover (Williams & Reid, 2007). Life events, including positive work experiences, separation from a negative familial environment, meaningful relationships, marriage, and children, also promote recovery (Beresin et al., 1989; Hsu et al., n.d.; Tozzi et al., 2003).

Techniques that enhance motivation are increasingly used to treat this disorder. Clinical experience suggests that documenting early osteopenia and explaining the physiological effects of weight loss may help to motivate patients who deny having the disorder (Yager & Andersen, 2005). Besides that, not meeting the patients at their own stage and imposition of goals will likely result in treatment failure. Therefore, it is important to negotiate treatment goals based on both the patients’ and experts’ understanding of desirable outcome, thus leading to a greater involvement of patients in treatment (Keski-Rahkonen & Tozzi, 2005).

The treatment of anorexia nervosa should be seen in a multidisciplinary way in consequence of its multifactorial etiology. Thus, seeking the efficacy of the healing process.

Initial outpatient treatment often involves a primary care physician, a psychiatrist or psychologist familiar with anorexia nervosa, and a registered dietitian. Therefore, it is important that communication between all elements of the multidisciplinary team is efficient to enhance the treatment (Keltner, Schwecke, Bostrom, & Calvacca, 2007).

There are three different treatment settings for anorexia nervosa: inpatient specialty eating disorder units, partial hospitalization and outpatient therapy. The choice of setting depends on the severity of the illness (weight loss, physical symptoms, duration of binging and purging, drive for thinness, body dissatisfaction and comorbid psychiatric conditions) (Black & Andreasen, 2014). Longer inpatient stays are required for those who gain weight more slowly and are more resistant to gain additional weight. Regarding to outpatient therapy, it works better with patients who have been ill for fewer than 6 months, are not binging and purging, and have parents likely to participate effectively in family therapy (Thiels, 2008).

The effectiveness of the treatment is often determined by criteria like weight gain and adequate food intake (Videbeck, 2014). It is important that the patient remains in treatment for one to two years after weight restoration to prevent relapse (Yager & Andersen, 2005).

Medications have always played an important role in the treatment of patients with anorexia nervosa, but they have been rarely used as the sole form of intervention (David Garner et al., 1997). The treatment of anorexia nervosa changed in the second half of the 20th century from a exclusively medical approach to a strong emphasis on individual psychotherapy (Bruch, 1973). Later, behavioral and cognitive interventions were included on the treatment programs (Bemis, 1987). In younger patients, the inclusion of family therapy has been defended since the 1970s (H. Steinhausen, 2002).

Following, we will discuss the treatment options for anorexia nervosa:

8.1- Pharmacological Therapy

The pharmacological therapy used in anorexia nervosa is directed to the treatment of anxiety, depression, somatic changes or other co-morbidities associated with this disease (Keltner et al., 2007). However, managing individuals with anorexia nervosa only with medication is inappropriate for many reasons: (1) no pharmacological intervention for anorexia

nervosa has a significant impact on weight gain or the psychological features of anorexia nervosa; and (2) medication treatment for anorexia is associated with high dropout rates (Bulik, Berkman, Brownley, Sedway, & Lohr, 2007).

Several classes of drugs have been studied, but few have shown clinical success. Studies found that medication was not perceived as affecting core eating disorders symptoms. However, it was viewed as helpful in relieving mood and anxiety symptoms (Beresin et al., 1989; Hsu et al., n.d.; Tozzi et al., 2003).

Among the drugs most commonly used on the treatment of patients with anorexia nervosa are anxiolytics, antipsychotics and antidepressants. In addition, hormones such as testosterone, growth hormone, estrogen and progesterone are also used (Bulik et al., 2007).

Anxiolytics

Anxiolytics help patients to control their anxiety related to meals. It also helps to decrease the intensity of compulsive eating episodes (Keltner et al., 2007).

Antipsychotics

Studies suggest that the use of atypical antipsychotic agents at low doses (e.g., olanzapine) may improve weight gain, symptoms of depression, and obsessional thoughts (Barbarich et al., 2004; Malina et al., 2003; Powers, Santana, & Bannon, 2002).

Antidepressants

Fluoxetine: It is an antidepressant of the Selective Serotonin Reuptake Inhibitors (SSRIs) class. Fluoxetine has some effectiveness in reducing purging behavior and depression. It also prevents relapse in patients whose weight has been partially or completely restored (Keltner et al., 2007).

One placebo-controlled trial involving patients who had regained weight showed that those taking fluoxetine at doses of 20 to 60 mg per day were more likely to maintain their weight gain and had fewer depressive symptoms after one year (W H Kaye et al., 2001). Differently, another study with fluoxetine did not find significant differences between fluoxetine and placebo on eating, psychological, or biomarker measures in anorexic patients (Malina et al., 2003).

Amitriptyline (Tricyclic Antidepressant- TCA): It is the most widely used TCA. One study that compared amitriptyline and cyproheptadine and placebo in 72 anorexic women found that significantly fewer days were needed to achieve target weight with both amitriptyline and cyproheptadine groups than with placebo (K A Halmi, Eckert, LaDu, & Cohen, 1986). Another study with amitriptyline led to no significant differences in eating, mood, or weight outcomes in comparison with placebo (Biederman et al., 1985).

Hormones

One study with transdermal testosterone reported significantly less increase in depressed mood in patients on transdermal testosterone than in those on placebo (Miller, Grieco, & Klibanski, 2005). Another study compared two groups of women, one using estrogen/progesterone and another with no medication. The groups did not differ on bone density measures at 6 months (Klibanski, Biller, Schoenfeld, Herzog, & Saxe, 1995).

8.2- Nutritional Therapy

Nutritional therapy is based on recovery to normal weight, nutritional rehabilitation and correction of water and electrolyte imbalances (Sadock & Sadock, 2000). It is important to highlight that nutritional rehabilitation during the period of bone growth is very effective in reversing bone loss (Lantzouni, Frank, Golden, & Shenker, 2002).

Numerous observational studies suggest that initial treatment should focus on prompt weight restoration (American Psychiatric Association, 2000; Beumont et al., 2004; Dix, 2004).

However, It is important that the therapist strives to accomplish the weight restoration without inflicting psychological damage (Bruch, 1977).

One example of nutritional therapy is the use of zinc supplementation. In a study with anorexic patients, zinc supplementation was associated with accelerated increase of Body Mass Index (BMI) (C L Birmingham, Goldner, & Bakan, 1994).

The progressive weight loss of anorexics should be interrupted immediately, and substantial weight gain at a very early point in treatment may be indicated for severely malnourished patients. These patients may require total parenteral nutrition, tube feedings, or hyperalimentation to receive adequate nutritional intake. Children or teenage patients who are losing weight rapidly, regardless of the percentage of body weight lost, generally require hospitalization to ensure food intake and to limit physical activity (Videbeck, 2014).

In the case of inpatients, their weight, food intake, caloric intake and urine output should be monitored. In addition, these patients should be watched to avoid purging behaviors. As for outpatients, there should be a weekly monitoring of weight and an evaluation of electrolyte balance, as well as a regular physical exam (Sadock & Sadock, 2000).

No particular nutritional regimen has been proved to be superior, as long as adequate calories are supplied (Okamoto et al., 2002). For inpatients that can eat, a diet of 1,200 to 1,500 calories per day is ordered, with gradual increases in calories until they are ingesting adequate amounts for their height, activity level, and growth needs. Usually, prescribed calories are divided into three meals and three snacks. A liquid protein supplement is given to replace any food not eaten to ensure consumption of the total number of calories (Videbeck, 2014). For outpatients, a diet of 1,200-1,500 calories per day, with weekly increases of 500 kcal per day, would result in a weight restoration of 0.5 to 0.9 kg (1 to 2 lb) per week (American Psychiatric Association, 2000).

Some patients can experience a refeeding syndrome (reported in about 6% of hospitalized adolescents) (Kohn, Golden, & Shenker, 1998). A refeeding syndrome is most common among patients weighing less than 70% of their ideal body weight and in those receiving parenteral or enteral nutrition, although it can also occur in those receiving vigorous oral refeeding. This syndrome may include minor abnormalities (e.g., transient pedal edema) or serious complications that require urgent intervention (e.g., a prolonged QT interval or

hypophosphatemia with associated weakness, confusion, and progressive neuromuscular dysfunction) (Yager & Andersen, 2005).

Refeeding usually reduces apathy, lethargy, and food-related obsessions, although it does not eliminate them completely. One important fact to pay attention is that rates of relapse and rehospitalization are higher among hospitalized patients who are discharged at low weights and before they and their families can assume responsibility for refeeding than among patients discharged at expected healthy weights, when they and their families can assume such responsibility (Howard, Evans, Quintero-Howard, Bowers, & Andersen, 1999).

It is important to notice that weight restoration does not mean recovery. Many young women who appear to be “normal weight” might still be struggling with the day-to-day problems of anorexia: ways in which they may experience their bodies as “shameful” with regard to any pleasurable relationship with foods (Emma Rich, 2006).

8.3- Psychotherapy

There are several psychotherapeutic approaches (cognitive, supportive, dynamic, family, individual, and group) used on the treatment of anorexia nervosa. They are used at different stages of the disease or according to the patient's individual need (Bulik et al., 2007).

It is very important that therapists who accept to treat anorexic patients try to build a warm and supportive relationship as a prerequisite to the work of psychotherapy. The therapist should reassure the patient that the patient's experience, rather than the therapist's opinions, will be used to guide the course of treatment (DM Garner & Bemis, 1982).

Specific therapeutic approaches include cognitive behavioral therapy (CBT) (Pike, Walsh, Vitousek, Wilson, & Bauer, 2003), cognitive analytic therapy (CAT) (Treasure et al., 1995), focal psychoanalytic therapy (Dare, Eisler, Russell, Treasure, & Dodge, 2001), specialist supportive therapy (McIntosh et al., 2005), and family therapy (Eisler et al., 2000).

A Cochrane review that included six small trials of psychotherapy concluded that psychotherapy (including psychoanalytic therapy, cognitive behavioral therapy or cognitive analytic therapy) resulted in improved restoration of weight, return of menses among female

patients, and improved psychosocial functioning, as compared with routine treatment (Hay, Bacaltchuk, Claudino, Ben-Tovim, & Yong, 2003). In addition, others studies affirm that psychotherapy is helpful in dealing with emotions, and with enhancing willpower and self-confidence (Hsu et al., n.d.; Tozzi et al., 2003).

Cognitive Behavior Therapy (CBT)

CBT has been used increasingly in recent years. It is a very directive and time-limited therapy. Therapist and patient work together to identify irrational beliefs and illogical thinking patterns associated with body image, weight, food, and perfectionism. In this type pf therapy, there is a focus on the behavioral components of the illness (binge eating, purging, dieting, and ritualistic exercise) (Pike et al., 2003).

One study showed that CBT significantly reduced relapse risk and increased the likelihood of good outcomes compared with nutritional counseling (Pike et al., 2003). Another study compared CBT with behavioral therapy (BT) and a control group for 6 months. At 12-month follow up, CBT and BT combined improved nutritional functioning more than the control (Channon, de Silva, Hemsley, & Perkins, 1989).

Among adult patients, cognitive behavioral therapy in particular may be better in reducing relapse rates, as compared with nutritional counseling (Pike et al., 2003).

Cognitive Analytic Therapy (CAT)

This treatment combines elements from the cognitive, brief, focused and psychodynamic psychotherapy. It is designed to help patients gain a multi-faceted understanding of themselves through the management of their feelings and relationships (Dare et al., 2001; Treasure et al., 1995).

Two studies that utilized CAT failed to find any advantage of CAT over educational BT or focal family therapy in eating, mood, or weight outcomes (Dare et al., 2001; Treasure et al., 1995).

Focal Psychoanalytic Therapy

This is a standardized form of time-limited psychoanalytic psychotherapy. In this type of therapy, the therapist takes a non-directive approach. No advice is given regarding the eating behavior, symptoms or problems. The focus is on the meaning of the symptoms in terms of the patient's history and experiences with his or her family. It also focus on the patient's desire to get benefit from the therapy (Dare et al., 2001).

Supportive Psychotherapy

The goal of this type of therapy is to lower anxiety. Usually, this is done through reassurance, advice, support of the individual's personal strengths and encouragement of more adaptive defenses (Santucci, 2014).

In a study with fifty-six women with anorexia nervosa, they were randomly assigned to three treatments. Two were specialized psychotherapies (cognitive behavior therapy and interpersonal psychotherapy), and one was a control treatment combining clinical management and supportive psychotherapy. This study found that nonspecific supportive clinical management was superior to more specialized psychotherapies (McIntosh et al., 2005).

Family Therapy

Commonly, eating disorders are seen as a problem of family life that affects all family members (Dare et al., 2001). This is why family therapy is considered very important.

Some view family therapy as a treatment WITH the family, others as a treatment OF the family. Through family therapy, families who demonstrate conflicts, unclear boundaries among members, and difficulty handling emotions can begin to resolve these issues and improve communication. It is also useful to help members to be effective participants in the patient's treatment (Videbeck, 2014).

Family therapy focusing on parental control of renutrition is efficacious in treating younger nonchronic patients with anorexia nervosa. It leads to clinically meaningful weight gain

and psychological improvement (Bulik et al., 2007). One study that included both adolescents and adults, determined that family therapy was more effective for younger patients with earlier onset than for older patients with a more chronic course (Eisler et al., 1997). Another study found that family therapy is more effective than individual supportive therapy in preventing relapse among patients 18 years of age or younger (Dare et al., 2001).

Others studies that focused on family therapy found that when combined with a common medical and dietary regimen, family therapy was superior to ego-oriented individual therapy in increasing BMI and restoring menstruation (Robin, Siegel, & Moye, 1995). Another study that focused on adults with anorexia nervosa found family therapy to be superior to routine treatment, but equivalent to a CAT in increasing percentage of adult body weight and restoring menstruation (Dare et al., 2001).

In the next chapter, we will talk about an important factor that contributes to the delay of the recovery progress of anorexic patients, the use of pro-anorexia (pro-ana) websites.

CHAPTER II:

PRO-ANA WEBSITES

The internet provides access to an extraordinary amount of health information. Although it can be a source of legitimate health promotion information, it may also be used as a tool for the exchange of inaccurate information and promotion of unhealthy behaviors (Finfgeld, 2000; Johnsen, Rosenvinge, & Gammon, 2002). It is specially concerning because adolescents frequently use the internet to search for health information and, as a consequence, they change their behavior as a result of what they find (Brodie et al., 2000; Rideout, 2002).

Of particular concern are the pro-ana websites. Pro-ana websites promote anorexia nervosa as a lifestyle rather than a disease, potentially making it seem less serious to site visitors (Peebles et al., 2012; Wilson et al., 2006). Pollack (2003) suggests that pro-ana websites are a form of rebellion against the strong medical focus of anorexia as a disorder (Pollack, 2003).

Anorexia gives the pro-anorexics desired results. For some this may be self-control, while for others it may be a thinner body shape or a sense of achievement but for most, whatever the results they are looking for, their anorexia causes them to feel better about themselves (Williams & Reid, 2007). Many sufferers describe anorexia as “a productive and empowering state of distinction”, particularly in the early phases of the disease. Comparatively, there are few other chronic illnesses where sufferers actually seek out, or “desire”, the condition (Warin, 2004).

Pro-ana sites are indicative of the “desire” to have anorexia. This desire is not rare among adolescent girls. For many of them, anorexia is the synonym of thinness and achievement (Emma Rich, 2006). On pro-ana sites, striving to be underweight is considered not only as normative but also as a sign of success.

Pro-ana websites allow visitors to talk freely and share their experiences with a sense of personal safety (Mulveen & Hepworth, 2006). Consequently, they promote a community of support and encouragement for visitors to embrace their disease and to lose even more weight, allowing perpetuation of anorexia nervosa in the absence of treatment (Dolan, 2003). It is a place where visitors gain advice, encouragement and reassurance (Williams & Reid, 2007).

Hundreds of pro-eating disorder (pro-ED) online communities have also emerged on social networking websites such as Facebook and MySpace (Juarascio, Shoaib, & Timko,

2010), which present new opportunities for vulnerable individuals to become involved with pro-ED groups.

Factors such as the easy accessibility of the internet and the increasing prevalence rate of anorexia nervosa may be strong contributors to the existence and popularity of the pro-ana movement. The pro-ana movement involves having positive feelings about anorexia. A creator of a pro-ana website described the pro-ana movement as: "…a movement of empowerment among females and males that have an eating disorder and do not want to recover" (Williams & Reid, 2007).

In a comparison of site contents and demographics of pro-ana sites and pro-recovery sites, a study found that pro-ana sites are better organized, comprehensive, visited more often and more numerous than sites based on recovery. Pro-ana sites had a mean of counted visits of 34,988 whereas pro-recovery sites had a mean count of visits of 27,878 (Chesley, Alberts, Klein, & Kreipe, 2003).

Pro-Ana Websites and Visitors

Pro-ana is an example of online community that allows socially isolated or stigmatized individuals to interact with other people who are experiencing the same situation, and to share experiences in relative anonymity. Since, individuals with eating disorders have difficulty relating to peers of the same age (Schutz & Paxton, 2007; Stewart, Schiavo, Herzog, & Franko, 2008), they consider these sites "safe havens"- a place to connect with others who have similar problems and philosophies, away from the judgmental eyes of society (Borzekowski, Schenk, Wilson, & Peebles, 2010; Schutz & Paxton, 2007). However, a deep immersion in these communities can prohibit any alternative discourse about their disorder, thus further isolating them from the '"outside" world (Tierney, 2008).

Wallace (1999) affirms that when a person interacts with a small subset of like-minded others his/her framework for social comparison could become further warped. Consequently, this person could quickly acquire an exaggerated perception of the rightness of his/hers (Wallace, 2001).

Having the freedom to talk about eating disorders is seen as an advantage of pro-ana sites due to the stigma associated with eating disorders in “real life”. Individuals with eating disorders appear to use pro-ana sites as an exclusive place where they can experience tremendous personal freedom to be themselves and not have to hide their eating disorder from others (Mulveen & Hepworth, 2006).

Usually, pro-ana website visitors are individuals struggling with eating disorders or visitors who do not actually present an eating disorder (ana by choice), but only want to explore extreme methods of weight loss. Commonly, they find these sites by chance or by reading about them (Wilson et al., 2006).

The reasons why people visit pro-ana sites vary widely. Some of them seek weight loss motivation or new diets, while others look for sympathetic sufferers, interaction with others, emotional support, and a sense of belonging and acceptance (Dolan, 2003; Peebles et al., 2012). Although there is merit to the claim that some pro-ED websites provide emotional support to visitors, this support is often superficial and conditional upon active participation and conformity to group norms (Rouleau & von Ranson, 2011). Therefore, it may be insufficient to deliver the long term support that is required to buffer the psychological, physical, and emotional devastations of anorexia (Brotsky & Giles, 2007).

Researchers have noted that people who visit pro-ED websites might be maintaining rather than initiating disordered eating patterns (Brotsky & Giles, 2007; Lapinski, 2006). In a study with visitors of pro-eating disorder websites, the reported average age at onset of visiting pro-eating disorder websites was higher than the reported age at onset of other disordered eating behaviors. Thus, suggesting a disease progression in which pro-eating disorder website visitation is a later consequence of the disease, and not an earlier cause (Peebles et al., 2012).

Pro-Ana Websites and the Media

Media discourse concerning the existence of pro-ana sites began in the late 1990’s. However, the majority of the public discussion that highly sensationalized this phenomenon only began in 2001. Since then, pro-ana websites have received widespread media attention and have been of great concern among health professionals. Members of the Academy of Eating

Disorders and other health professionals consider pro-ana sites to be very harmful. They believe that such websites may act as a trigger for vulnerable individuals (Giles, 2006). Also, they fear that by participating in the pro-anorexic way of life, many visitors can go too far, causing themselves severe harm and possibly death (Bardone-Cone & Cass, 2007).

In 2001, the National Association of Anorexia Nervosa and Associated Disorders (ANAD) put pressure on public servers like Yahoo, which was hosting more than 100 pro-ana sites, to disable these sites. However, following the shutdown, many pro-ana sites were recreated using other servers, insuring continued operation and access of these sites by the public (Dolan, 2003). In opposition to the disappearance of pro-anorexic sites an online petition has been set up to keep these sites running. On the 10th January 2015, this petition had 12999 signatures ("Allow Pro-Anorexia pages!," 2002).

While some health professionals fight to shutdown these websites, others feel that if these websites were closed up, it would push the women to go further underground (Dolan, 2003). In addition, Moore (2001) affirms that the negative press coverage actually increases site activity suggesting that the curiosity value of "deviant" sites may drive up site traffic and consequently expose greater numbers of people to unhealthy weight-control behaviors (Moore, 2001).

1- Pro-Ana Websites Content

Pro-ana websites are very easy to access by anyone and the minority of them requires membership. They are also very easy to understand (written at less than a high school grade level) (Borzekowski et al., 2010). Thus, providing access to people of a variety range of age. It has been documented that children as young as 12 years old have used pro-ED websites (Custers & Van den Bulck, 2009).

Usually, these websites are very interactive, not static or read only. Pro-ana websites allow their visitors to post comments or artwork, communicate via an online forum or message board, and use personalized diet or exercise-related tools (Borzekowski et al., 2010; Giles, 2006; Norris, Boydell, Pinhas, & Katzman, 2006).

Most pro-ana websites is maintained by a singular female individual, which claim to have an eating disorder. Most visitors are also females. Each site owner has her own perspective on what it means to be anorexic. Even visitors are unsure as to whether anorexia is a lifestyle, an illness, or a positive or a negative experience. Some of them use terms like ‘illness’, ‘disease’ and ‘sick’, while others celebrate anorexia as a ‘choice’ or even a ‘lifestyle’ (Custers & Van den Bulck, 2009; Giles, 2006).

Pro-ana websites have their own terminology. For example, anorexia is spoken of as “ana”. Also, it is often described as metaphors such as “friend”, “enemy”, “saint” or “goddess” (Dias, 2003).

Commonly, pro-ana sites warn visitors that some of the posted material might be dangerous or distressing through disclaimers. These disclaimers are warnings, that inform visitors that the content of the website may be “triggering” for some people (e.g., messages asking non-eating disordered individuals to leave the website, acknowledging that the website supports the pro-ana movement and/or prohibiting individuals under the age of 18 to enter without prior parental consent) (Norris et al., 2006). Such disclaimers act as insurance against irresponsibility, thus trying to protect the integrity of the community (Giles, 2006).

These disclaimers may warn unsuspecting readers away from distressing content. However, it may entice vulnerable individuals to read further (Borzekowski et al., 2010). Research on other types of media, such as movies and video games, suggests that labels might entice young viewers to want to see media that are not appropriate for them (Bushman, 2006). In contradiction to that, Martijn, Smeets, Jansen, Hoeymans, and Schoemaker (2009) found that including a warning message before accessing a pro-ana website diminished the number of visitors to the pro-ana website by one-third, and so may have decreased potential harm by reducing exposure (Martijn, Smeets, Jansen, Hoeymans, & Schoemaker, 2009).

Reaves (2001) states that these sites show a dichotomy of messages, as although the homepages outline de dangers of these websites through disclaimers, all subsequent pages give a message of encouragement to do everything possible to achieve the ideal body (Reaves, 2001).

To date, only a few studies have reported on the content of pro-ana sites. Content analyses have revealed consistency in the type of topics displayed on it. The most frequent

topics are: tips and techniques section, “thinspiration” or “thinspo” (images of extremely thin women), “thin commandments”, chat rooms, forums, eating disorder accessories (e.g., pro-ana bracelets), poetry and song lyrics reflecting the experience of anorexia and links to other websites related to the same subject (Borzekowski et al., 2010; Giles, 2006; Norris et al., 2006). Some sites also contain guest books in which new visitors can sign in and list their current weight and goal weight (Lapinski, 2006).

Some aspects of pro-ana sites potentially represent a great deal of harm, such as abundance of images of very thin/anorexic women, information on how to engage in disordered eating behaviors, tips on ways to conceal eating disorders from others, and encouragement of extreme dieting practices (Bardone-Cone & Cass, 2006). Some websites even host competitions to find the “best anorexic” (Emma Rich, 2006).

Following, we will explore common features of the pro-ana websites:

1.1- Tips and Techniques

Tips and techniques sections are extremely common on pro-ED websites. A recent content analysis found that 83% of 220 pro-ED websites contained either a section explicitly dedicated to disseminating tips and techniques, or contained tips and techniques throughout the website (Borzekowski et al., 2010).

This section represents the single most serious medical risk for visitors. It offers unregulated information that has the potential to increase both the short-term and long-term medical risks associated with anorexia nervosa (Norris et al., 2006).

The tips and techniques section usually offers dieting strategies (specific dietary regimes and advice on fasting), lists of “safe” foods or low-caloric foods, and advice on the use of laxatives, diet pills and bowel cleansing enemas. Techniques typically include methods of hiding weight loss, calorie avoidance, and ways to distract self from being hungry and maintain self-control (Borzekowski et al., 2010; Norris et al., 2006). Sometimes, it also offers assistance in avoiding detection by family, friends and health professionals, through suggestions on how to hide or mask dieting behavior and an anorexic body shape (Norris et al., 2006; Peebles et al., 2012).

Table 7- Examples of Tips and Techniques

Tips and Techniques
"Take cold showers and eat spicy foods to stimulate your metabolism"
"Make a list of all the things you shouldn't eat and read it 20 times"
"Keep a thinspiration book. Get a really nice journal and print pictures of skinny models, tips, quotes, or workouts, and glue it in there,"
"Spend time every day on pro-anorexic sites"
"Buy vinegar pills…or put vinegar in your food it soaks up fat"
"Brush your mouth and teeth often…a fresh mouth helps keep you from wanting to eat"
"Chew food and then spit it out you will still swallow a small amount of food…it feels like you are actually eating"
"Pour something gross on your food like dish soap or salt so you can't eat it"
"Do exercises at night to avoid raising suspicion"
"This is your life you only get one on this earth: take control"

Adapted from Lapinski, 2006.

A content analysis of nine pro-ana sites focused on the most common advices found on the tips and techniques section of each site. It showed that advices about eating/restricting calories, distractions, and lying/concealing symptoms were the most commonly given advice. Besides that, tips on fasting and purging were also prominent (Harshbarger, Ahlers-Schmidt, Mayans, Mayans, & Hawkins, 2009).

In a study with patients who viewed pro-ED sites, the majority of them stated that they learned new weight loss and/or purging methods through these websites (Wilson et al., 2006). In another study, females undergoing eating disorder treatment reported that the tips and tricks on pro-ED websites had worsened their eating disorder symptoms by prompting feelings of being "triggered" to act on eating disorder-related urges (e.g., obsessions about nutritional information) and by teaching inappropriate, hazardous compensatory behaviors (Schroeder, 2009).

This particular section of pro-ED websites may be dangerous even to individuals who do not have anorexia. Studies suggest that discussing techniques and their perceived benefits may have contagious effects even on those not yet committed to these behaviors (Whitlock, Powers, & Eckenrode, 2006).

1.2- Thinspiration

The mass media is considered one of the most powerful and influential sociocultural factor contributing to body dissatisfaction in Western society through the exhibition of images of thin women, the beauty standard (Borzekowski & Bayer, 2005; Groesz, Levine, & Murnen, 2002). The thin images of women projected by mass media are usually 15% lower in weight than the average woman, making the image unattainable for most women (Jett et al., 2010). The majority of pro-ana websites show this type of images in a section called “thinspiration” or “thinspo”.

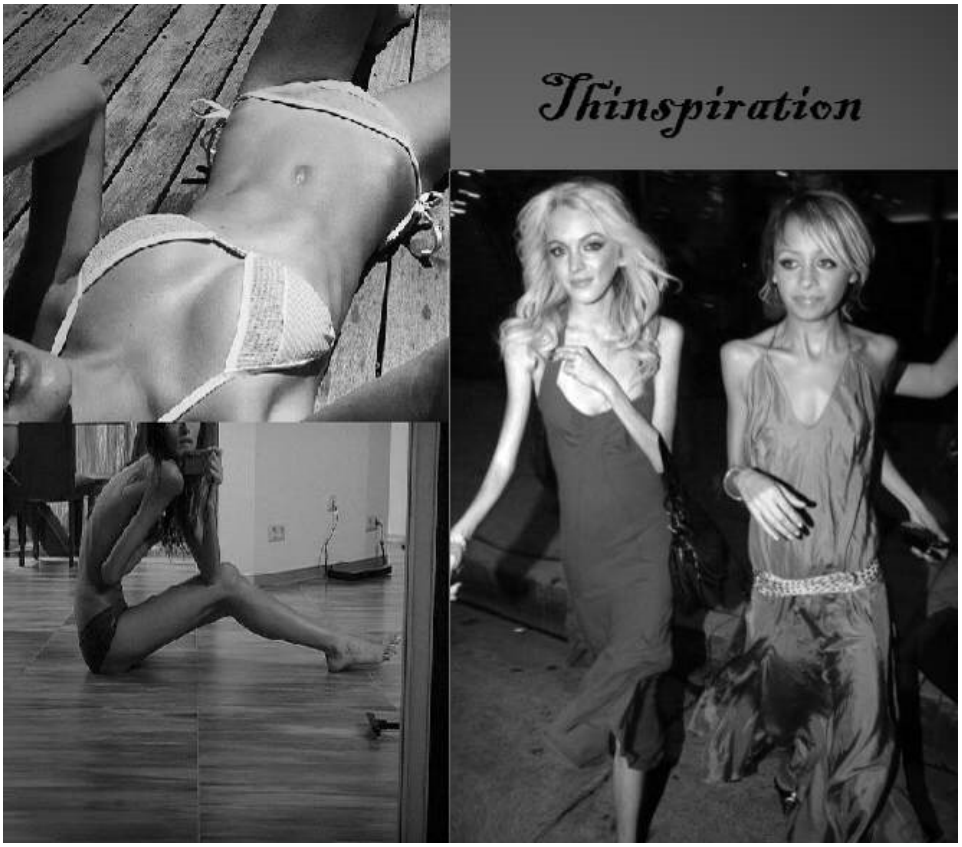
The thinspiration section provides visual representations of the distorted body image typified in anorexia nervosa. Pictures of extremely thin young females aim to provide encouragement and serve as motivation for continued and sustained weight loss. Often, this section contains photos of famous fashion models, celebrities and athletes or even manipulated photos. These images are featured positively for the purpose of maintaining disordered eating behaviors (Borzekowski et al., 2010; Norris et al., 2006).

Some pro-ED website visitors believe thinspiration galleries are comparable to images found in mainstream media, whereas other visitors believe that mainstream media images are worse than thinspiration galleries because they are not accompanied by warnings about their potentially triggering or upsetting nature (Schroeder, 2009).

In one study, 59% of pro-ED website visitors reported that viewing pictures of “thinspiration” was a motivation for visiting these sites (Csipke & Horne, 2007). It is specially concerning because the use of thin media images in pro-ED websites is a likely mechanism of worsening eating disorders among visitors (Wilson et al., 2006).

Several sites have a section called “Ana of the month” exhibiting a picture of a thin woman, in some cases a famous person or model, accompanied by a description of her weight-related characteristics (Lapinski, 2006).

Figure 1- Example of Thinspiration



Thinspiration galleries contain what site designers commonly termed *triggers, reverse triggers,* and *distractors.* According to the descriptions provided on several sites, *triggers* are typically photographs to motivate or encourage continuation of disordered behaviors. *Reverse triggers* are images designed to repel receivers (pictures of obese people to warn anorexics about what could happen if they do not stick to their routines), and *distractors* are images to help the receiver not think about eating despite hunger (Jackson & Elliott, 2004; Lapinski, 2006).

1.3- Chat Rooms

Usually, anorexics feel disconnected from their families, friends, health professionals and even their own bodies. Most significantly, many of them feel that this disconnection is related to the ways in which others “read” their anorexic body, pathologizing it (E. Rich, Holroyd,

& Evans, 2004). In other words, significant others read anorexia mainly through physical signs (Emma Rich, 2006). Consequently, anorexics feel that they are not well understood by others around them. Also, they think that intervention and influences from others may mean that attempts will be made to take their anorexia away from them. Therefore, they prefer to connect with other like-minded individuals (Williams & Reid, 2007).

For those reasons, many anorexics try to find alternative contexts within which they could find sanctuary, support and comfort with others, usually other sufferers (Emma Rich, 2006). Consequently, chat rooms may be one of the reasons why pro-ana sites are so appealing. This is a place where pro-anorexics can share their progress, offer support when things go wrong, and team up for group fasts amongst other things. Through chat rooms, pro-anorexics have a chance to talk openly about their attitudes towards their behaviors, which they are unable to do anywhere else. They can also get reassurance that they are not the only one in their situation (Williams & Reid, 2007).

Usually, participants of pro-ana chat rooms have similar things in common and are able to form positive relationships with each other. They understand what the other is going through, so they can offer empathy and support to each other. In addition, they show gratitude for the tips and advice they receive, compliment each other on their “success”, worry about each other, and miss one another when they haven’t visited the website for a while (Williams & Reid, 2007).

These social connections often give visitors of pro-ana sites a sense of social support that may ultimately be harmful. Confirmation and reinforcement from others may encourage them to continue and/or increase their disordered eating behaviors and thoughts (Bardone-Cone & Cass, 2006). Besides that, this communication has another potentially hazardous effect: it can foster competition among anorexic individuals, leading to increases in dangerous behaviors (Emma Rich, 2006).

1.4- Thin Commandments

Many of the pro-anorexics express a need for feeling in control. By controlling their weight, anorexics are exercising self-control and taking control of their lives. Their extremely thin bodies are the desired result of this control (Hepworth, 1999; Malson, 1998).

Pro-anorexics follow rules to help them to stay in control. They follow those rules as part of the anorexic lifestyle. Those rules are mostly known as “thin commandments”, which are found in the majority of pro-ana sites. They are often displayed as examples of the pro-ana philosophy (Borzekowski et al., 2010).

The fact this section is named with biblical terms linked with the nature of the content brings a strong tone of religious faith to the pro-anorexic way of life (Williams & Reid, 2007). This interestingly reflects the “pre-history” of anorexia when the women who starved had religious motivations (Stacey, 2003).

Table 8- Examples of Thin Commandments

Thin Commandments
If you aren’t thin you aren’t attractive.
Being thin is more important than being healthy.
You must buy clothes, cut your hair, take laxatives, starve yourself, do anything to make yourself look thinner.
Thou shall not eat without feeling guilty.
Thou shall not eat fattening food without punishing oneself afterward.
Thou shall count calories and restrict intake accordingly.
What the scale says is the most important thing.
Losing weight is good/gaining weight is bad.
You can never be too thin.
Being thin and not eating are signs of true will power and success.

Adapted from Costin, 1997.

1.5- Forums

Frequently, discussion forums attract thousands of postings on a huge variety of eating disorders related topics. On these forums, visitors can learn about, discuss and reinforce disordered eating behaviors (Giles, 2006). This is potentially dangerous because any contact (face-to-face or online) with eating disordered others can provide a mechanism for becoming better skilled in anorexic behaviors (Nygaard, 1990).

A study examined the meaning of participation in a pro-ana site and its relationship with disordered eating by using an interpretative phenomenological analysis of fifteen separate message “threads” followed over a six-week period. It found that dietary restriction and special fasts were primary weight loss methods that participants discussed on the board. Discussion also centered on the use of diet pills, herbal remedies and caffeine use as methods to increase potential weight loss (Mulveen & Hepworth, 2006).

Another common theme running through many forums concerns the relative merits of ana. There is a general assumption that ana represents an eating disorder ideal, creating disregard for groups like “fakers” and “wannabes”. People from these groups are seen as intruders, bringing discredit to the community through negative press coverage. Another group often found on those forums is the “haters”. Haters are the most openly hostile out-group. They threaten the “safe haven” of the pro-ana community with unpleasant messages and challenges. Examples of haters are concerned relatives of pro-anorexics and males outsiders (Giles, 2006).

1.6- Pro-Ana Bracelets

Pro-ana bracelet is a new concept. It is an accessory that comes in a variety of styles to appeal to a range of age groups that suffer from anorexia. Anorexic individuals wear it to identify themselves as part of the pro-ana community and to meet others from the same group. Consequently, it promotes a sense of community among followers, and serve as a reminder for the endorsement and practice of anorexic behaviors. (Norris et al., 2006).

Pro-ana websites suggest that their visitors should wear it to secretly say that they are proud to be pro-ana and also to remind themselves not to eat when they look at the bracelet. In other words, it is a silent identifier, meant to promote the underground movement (Radulova, 2014).

Health professionals are very concerned about the use of these bracelets as they consider it another way to perpetuate the illness (Radulova, 2014).

1.7- "The Best Anorexic"

Some websites encourage comparison of appearances through a section where visitors can post their own photographs on a message board and receive comments about their weight and shape from fellow visitors (Fox, Ward, & O'Rourke, 2005). This section hosts competitions to find "the best anorexic" (Emma Rich, 2006).

Csipke and Horne (2007) found that, among 151 pro-ED website visitors, approximately 19% reported that pro-ED websites were harmful because of their promotion of competition among visitors (Csipke & Horne, 2007).

2- Impact of Pro-Ana Websites

To date, a limited number of studies have examined the relation between viewing pro-ana websites and outcomes related to health (Bardone-Cone & Cass, 2006; Bardone-Cone & Cass, 2007; Bardone-Cone et al., 2007; Delforterie, Larsen, Bardone-Cone, & Scholte, 2014; Jett et al., 2010; Peebles et al., 2012; Wilson et al., 2006). In addition, some articles in the popular press have also discussed their harmful effects, specially focusing on the potentially deadly effects of promoting self-starvation (Jackson & Elliott, 2004; Mulholland, 2010).

Growing evidence indicates that the use of pro-ana sites tends to negatively affect visitors of pro-ana sites in many aspects of life:

2.1- Identity

Anorexics struggle not only to reassert their self-determination but also to attempt to retain an identity, albeit an "anorexic identity". The selective passing on of practices or techniques of anorexia is a way of not just reaffirming this identity, but also ensuring that it is the "right" and "accepted" identity (Emma Rich, 2006).

The “anorexic identity” becomes a fundamental part of a person’s identity (Williams & Reid, 2007). It involves rejecting the negative labels of pathology and instead constructing a narrative of anorexia as affording status and empowerment (Emma Rich, 2006).

Researches affirm that dissociation from this identity is essential for recovery (Keski-Rahkonen & Tozzi, 2005). However, the use of pro-ana sites may intensify this sense of anorexia as an identity, thus hampering treatment progress by strengthening visitors' anorexic identities, particularly through the normalization of pathological cognitions, emotions, and behaviors (Gavin, Rodham, & Poyer, 2008; Giles, 2006; Lyons, Mehl, & Pennebaker, 2006; Tierney, 2006). This normalization is problematic because the more an individual's self-concept is tied to her eating disorder, the more difficult it may be for her to accept treatment (Tan, Hope, & Stewart, 2003).

2.2- Body Image

A study evaluated use of pro-ED websites among 1575 undergraduate women. Researchers found that participants who reported having visited pro-ED websites had significantly higher levels of body dissatisfaction and eating disturbances (e.g., food restriction, bulimic symptoms) than individuals who reported having viewed pro-recovery websites (Harper et al., 2008). In a study of 711 Belgian adolescents, Custers and Van den Bulck (2009) found that pro-ED website viewership was correlated with various predictors of eating pathology in female participants, including drive for thinness and worse perception of appearance (Custers & Van den Bulck, 2009).

2.3- Quality of Life

The World Health Organization (WHO) defines quality of life as *“an individual's perception of their position in life in the context of the culture and value systems in which they live and in relation to their goals, expectations, standards and concerns”.* It is a broad ranging concept affected in a complex way by the person's physical health, psychological state, level of independence, social relationships, and their relationship to salient features of their environment

("Study protocol for the World Health Organization project to develop a Quality of Life assessment instrument (WHOQOL).," 1993).

A study that verified the correlation between the use of pro-ED websites and quality of life showed a clear association between the level of pro-ED website usage and low quality of life (Peebles et al., 2012).

2.4- Self-Awareness

Bardone-Cone and Cass (2007) randomly assigned 235 healthy undergraduate women to view one of three researcher-designed websites for 25 min: a pro-ana website, a fashion website (with average-sized models), or a home décor website. A series of questionnaires was completed immediately before and after website exposure. Participants who viewed the pro-ana website reported higher perceived weight status (i.e., perception of being overweight) and an increased likelihood of exercising or thinking about their weight "today or tomorrow", than participants who viewed the control websites (Bardone-Cone & Cass, 2007).

2.5- Treatment

The label "pro-eating disorder" carries with it an "anti-recovery" connotation, which has led some experts to believe that pro-ED websites discourage visitors from seeking treatment for their eating disorders (Fox et al., 2005). In other words, researchers believe that pro-ED website visitors may also be hesitant to seek treatment for their eating disorders because of the resistance toward medical institutions that is often endorsed on these websites (Rouleau & von Ranson, 2011).

Individuals with eating disorders often feel freer to disclose issues relating to their disorder online than in the context of a therapeutic environment (Davies & Lipsey, 2003). On one study with visitors of pro-ED websites, only one-third of participants had ever received formal care for their eating disorder. These findings suggest that pro-ED website visitors are seeking support online instead of in a traditional health model (Peebles et al., 2012).

Mulveen and Hepworth (2006) suggest that participation in pro-ana sites, where disordered eating behaviors are discussed and encouraged as the norm, could contribute to increased levels of disordered eating (Mulveen & Hepworth, 2006). Consequently, this participation in pro-ana sites could harm the recovery process.

Additionally, studies found that visitors of pro-ED websites had longer length of illness, longer duration of treatment and more hospitalizations than non-visitors (Peebles et al., 2012; Wilson et al., 2006). Thus, as these studies indicate, the usage of pro-ED websites can delay the recovery progress of patients in treatment.

2.6- Caloric Intake

A study investigated the influences of exposure to pro-ED websites on college women eating behaviors. Female undergraduate participants were told they would evaluate the design of websites. They completed food diaries for one week, then were randomly assigned to view one of three actual websites over the course of two sessions for a total of 90 min: a pro-ana website, a health-related website, or a tourist website. Participants then completed another week of food diaries. Those who viewed the pro-ana website significantly decreased their caloric intake over the one week period between pre and post-website exposure by an average of 2472 calories, whereas no significant changes were found in the other two groups. These results add to the evidence that pro-ED websites may be harmful by encouraging and reinforcing disordered eating behaviors (Jett et al., 2010).

2.7- Perfectionism

Perfectionism has long been linked to anorexia nervosa (Bruch, 2001). Socially prescribed perfectionism, a type of perfectionism involving feeling that others have high expectations for oneself (Hewitt & Flett, 1991), may leave individuals particularly vulnerable to the effects of pro-ED website viewing (Bardone-Cone & Cass, 2007). In consonance, several studies have found that pro-ED website viewership was correlated with even higher scores on perfectionism (Bardone-Cone & Cass, 2007; Custers & Van den Bulck, 2009).

2.8- Self-Esteem

Viewing pro-anorexia websites has negative affective and cognitive effects on women. Trends indicated that women who viewed pro-anorexia websites decreased in self-esteem (Bardone-Cone & Cass, 2006; Bardone-Cone & Cass, 2007).

A pilot study experimentally examined the effects of viewing a prototypic pro-ana website in comparison to a prototypic female fashion site (featuring “average” sized women) and a home décor site. Results showed that for the 24 female undergrad students randomly assigned to view the prototypic pro-ana site, negative affect increased and self-esteem decreased. This pilot study suggests that viewing pro-ana sites has greater negative affective and cognitive effects on women than viewing the comparison sites (Bardone-Cone & Cass, 2006).

An expanded version of the previous study was conducted a year later. It investigated the affective, cognitive and expected behavioral consequences of viewing a pro-ana site on 235 female undergrad students. Participants exposed to the prototypic pro-ana site had greater negative affect and lower social self-esteem than those who viewed comparison websites (Bardone-Cone & Cass, 2007).

Growing evidence indicates that the use of pro-ana websites tends to negatively affect visitors. For example, pro-ana website visitors have reported higher levels of body dissatisfaction (Harper et al., 2008), lower quality of life (Peebles et al., 2012), longer duration of treatment (Wilson et al., 2006), more hospitalizations (Wilson et al., 2006), lower caloric intake (Jett et al., 2010), higher levels of perfectionism (Custers & Van den Bulck, 2009), and lower self-esteem (Bardone-Cone & Cass, 2006; Bardone-Cone & Cass, 2007).

Although this body of work has increased our understanding related to the consequences of using pro-ana websites, we have known little about the associations between the use of pro-ana websites and the quality of life of visitors. To our knowledge, no previous research has examined the boundary conditions of the effect of pro-ana website usage on quality of life. Precisely, what are the other variables associated to the influence of pro-ana website usage on quality of life? Besides that, most studies in this area collected data with the general population. Considering the analyzed literature, the need to conduct studies with a

clinical population (anorexic individuals in treatment) was felt. In this current study, we addressed this gap in knowledge through the study of a clinical population.

Aiming to add to the literature, in the following chapters we will describe how the use of pro-ana websites influences the quality of life of anorexic patients. Therefore, we consider this study essential in order to better understand the impact of using pro-ana websites.

CHAPTER III:

METHODOLOGY

This chapter will make the description of the methodology used on this study. Initially, we will propose a hypothesis for this dissertation's model. Second, we will present theoretical arguments that support this hypothesis. Third, we will describe the statistical analyses used in this study.

1. Objectives

General Objective

- This study had the general objective of studying the associations between pro-ana website usage and the quality of life of anorexic patients.

Specific Objectives

- To compare patients who visit pro-ana websites to patients who do not visit it, regarding different psychological variables as quality of life, eating disordered behaviors, body dissatisfaction, psychosocial impairment and self-esteem.
- To identify a path of influence between pro-ana website usage and the quality of life of visitors.

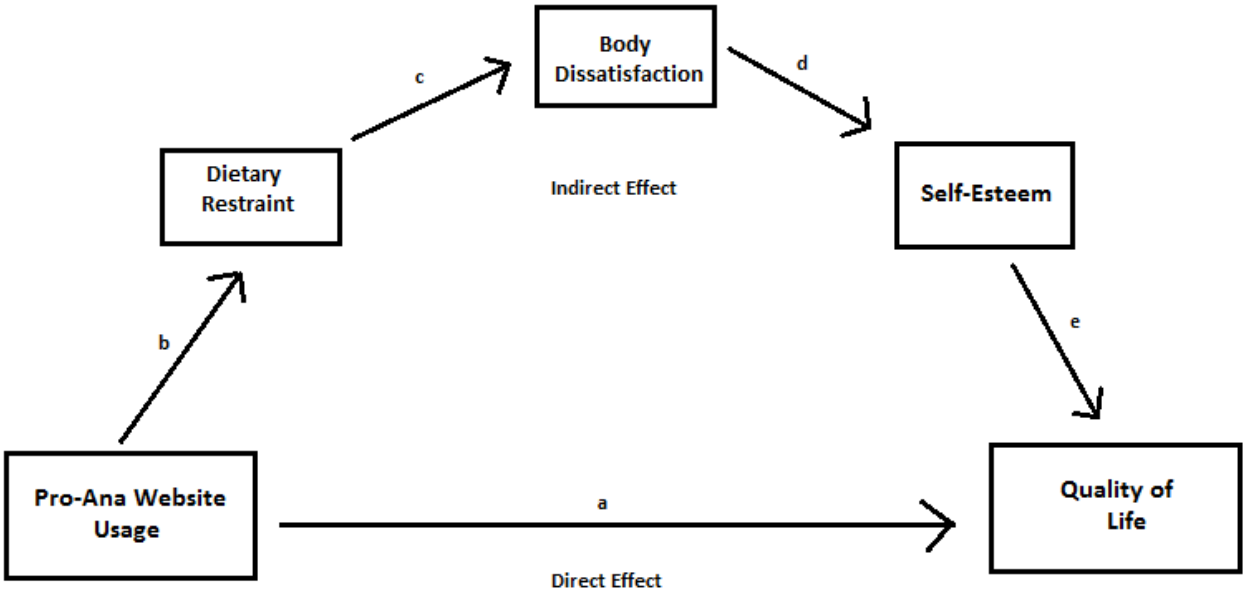
2. Hypothesis

According to the objectives mentioned before, we formally hypothesized that:

H1: Pro-ana website usage is positively associated with **dietary restraint**, which is positively associated with **body dissatisfaction**, which is negatively associated with **self-esteem,** which in turn is positively associated with **quality of life**.

In sum, the current study had the objective of testing the proposed links in our model (**Pro-Ana Website Usage → Dietary Restraint → Body Dissatisfaction → Self-Esteem → Quality of Life**)**.** Each part of this linkage (**a**, **b**, **c**, **d** and **e**) is shown on Figure 2.

Figure 2- Associations between pro-ana website usage and quality of life



(a): Pro-ana website usage is negatively associated with quality of life.

The exposure to pro-ana websites can have a number of affective and cognitive effects on people who are diagnosed as having eating disorders (Bardone-Cone & Cass, 2007). To date, however, only a few studies have examined the relation between viewing pro-ana websites and outcomes related to health (e.g. quality of life).

A recent study with over than 1,200 pro-ana website visitors, showed a clear association between the level of pro-eating disorder website usage and low quality of life (Peebles et al., 2012). In this study, heavy users of pro-eating disorder websites differed significantly from light users. In other words, results showed evidence that more pro-ana website usage was strongly associated with worse levels of quality of life.

(b): Pro-ana website usage is positively associated with dietary restraint.

Researchers have shown evidence that the people who visit pro-ana websites significantly decrease their caloric intake. These results add to the evidence that pro-ED websites may be harmful by encouraging and reinforcing disordered eating behaviors as dietary restraint (Jett et al., 2010). Another study with 1575 undergraduate women also found that participants who reported having visited pro-eating disorder websites (vs. pro-recovery websites) had significantly higher levels of eating disturbances including dietary restraint (Harper et al., 2008).

(c): Dietary restraint is positively associated with body dissatisfaction.

An important factor that causes fluctuations in body dissatisfaction is food intake (Vocks, Legenbauer, & Heil, 2007). A study with 80 Caucasian females attending commercial weight loss groups in the Northwest region of the UK showed evidence that greater dietary restraint is associated with lower body satisfaction (Lattimore & Hutchinson, 2010). The outcome of the aforementioned study supports laboratory studies regarding the relationship between dietary restraint and body satisfaction (Fett, Lattimore, Roefs, Geschwind, & Jansen, 2009; Geschwind, Roefs, Lattimore, Fett, & Jansen, 2008).

(d): Body dissatisfaction is negatively associated with self-esteem

In support of our proposition, researchers have shown that body dissatisfaction has a negative influence on self-esteem (Frost & McKelvie, 2004; Polce-Lynch, Myers, Kliewer, & Kilmartin, 2001). Consistent with this idea, another study with 242 female high school students also found that young girls with higher body dissatisfaction are more vulnerable to developing low self-esteem (Tiggemann, 2005).

(e): Self-esteem is positively associated with quality of life

Evidence suggests that self-esteem is a primary indicant of health, illness coping and quality of life (Carpenter, Brockopp, & Andrykowski, 1999). Researchers have found that low self-esteem can reduce quality of life in many different ways (Crocker, Luhtanen, Blaine, & Broadnax, 1994; “Self esteem,” 2012). In other words, self-esteem is the psychological factor that most influences the variance in quality of life and well-being of a person (Carpenter, 2008).

3. Participants

Fifty anorexic female patients were recruited. At the time our data was collected (from April 2015 to June 2015) patients were undergoing treatment at the Eating Behavior Disease Consultation/ Psychiatric Service/ Santa Maria Hospital, Lisbon (Director: Doctor Daniel Sampaio). Ethical approval for the study was obtained from the author’s university ethics committee and participants provided informed consent prior to participation. Participants were not compensated for taking part in the study.

4. Data Collection Instruments

4.1- Demographic and Clinical Questionnaire

After providing consent, participants answered a questionnaire. Its written language was Portuguese. Participants were given verbal and written instructions about how to complete it. This questionnaire was developed in order to collect demographic and clinical information. It included 13 questions about the use of pro-ana websites (e.g. number of pro-ana websites that the participant usually visit, reasons to visit pro-ana websites,...) and the clinical treatment (e.g. length of disease, length of treatment, type of treatment,…).

4.2- Other measures

We also asked participants to complete 5 scales: WHO Quality of Life-BREF (WHOQOL-BREF), Rosenberg Self-Esteem Scale (RSES), Body Shape Questionnaire (BSQ), Clinical Impairment Assessment questionnaire (CIA) and Eating Disorder Examination Questionnaire (EDE-Q).

* Quality of Life

Quality of life was measured using the questionnaire WHOQOL-BREF, which is a quality of life assessment developed by the WHOQOL Group. The WHOQOL-BREF is a subset of 26 items taken from the WHOQOL-100. It is a shorter version of the original instrument that may be more convenient for use in large research studies or clinical trials ("Development of the World Health Organization WHOQOL-BREF Quality of Life Assessment," 1998).

The WHOQOL-BREF produces a profile with four domain scores (physical health, psychological health, social relationships and environment) and two individually scored items about an individual's overall perception of quality of life and health. The four domain scores are scaled in a positive direction with higher scores indicating a higher quality of life.

Table 9- WHOQOL-BREF Domains

Domains	Facets Incorporated within Domains
1. Physical health	Activities of daily living Dependence on medicinal substances and medical aids Energy and fatigue Mobility Pain and discomfort Sleep and rest Work Capacity
2. Psychological	Bodily image and appearance Negative/Positive feelings Self-esteem Spirituality / Religion / Personal beliefs Thinking, learning, memory and concentration
3. Social relationships	Personal relationships Social support Sexual activity

4. Environment	Financial resources Freedom, physical safety and security Health and social care: accessibility and quality Home environment Opportunities for acquiring new information and skills Participation in and opportunities for recreation / leisure activities Physical environment (pollution / noise / traffic / climate) Transport

Adapted from WHOQOL-BREF Introduction, Administration, Scoring and Generic Version of the Assessment, 1996.

A study in Portugal showed that the WHOQOL-BREF has good psychometric characteristics (reliability and validity), suggesting that it is a good tool to assess quality of life in Portugal. The reliability of this scale was tested using Cronbach's Alpha (26 items - α = 0,92; Domain 1 (Physical Health) - α = 0.87; Domain 2 (Psychological) - α = 0.84; Domain 3 (Social Relationships) - α = 0.64; Domain 4 (Environment) - α = 0.78.) (Serra et al., n.d.).

In our study, Cronbach's Alpha for the 26 items was 0.92; Domain 1 (Physical Health) - α = 0.79; Domain 2 (Psychological) - α = 0.88; Domain 3 (Social Relationships) - α = 0.56; Domain 4 (Environment) - α = 0.74. After measuring the Cronbach's Alpha for Domain 3 (α = 0.56), we found that item 21 caused a substantial decrease in α. Besides that, this item specifically asks the participant about how satisfied the participant is with his/her sex life. Many participants did not answer this question. We believe it was related to their age range. Therefore, we decided to delete this item from our questionnaire. Afterwards, we measured α for Domain 3 and found α = 0.71.

*** Self-Esteem**

Self-esteem was measured by Rosenberg Self-Esteem Scale (RSES). It is one of the most widely used self-esteem measure. Self-esteem is a positive or negative orientation toward oneself; an overall evaluation of one's worth or value. A high self-esteem, as assessed by RSES, indicates positive self-regard, not egotism (Rosenberg, 1989).

This scale contains 10 items such as “I wish I could have more respect for myself”. Five items are of positive orientation and 5 of negative orientation. The RSES is scored as a Likert

scale. The 10 items are answered on a four-point scale ranging from “strongly agree” to “strongly disagree”. The scale ranges from 0-30, with 30 indicating the highest score possible.

This scale was validated to the Portuguese population (Santos & Maia, 2003), its reliability was tested using Cronbach's Alpha (α = 0,86). In this study, Cronbach's Alpha was also measured (α = 0,915).

*** Body Dissatisfaction**

The Body Shape Questionnaire (BSQ) is a 34-item self-report measure used to assess the degree of body shape and weight dissatisfaction (Cooper, Taylor, Cooper, & Fairburn, 1987). It includes questions about body image symptoms, such as distressing preoccupation with weight and shape, embarrassment in public and avoidance activity or exposure of the body due self-consciousness, and excessive feeling of fatness after eating (Rosen, Jones, Ramirez, & Waxman, 1996).

Participants responded to each of the 34 questions on a scale of 1 (never) to 5 (always). The total was computed as the sum of all items with higher scores reflecting greater body shape and weight dissatisfaction. This BSQ was validated to the Portuguese population and scores on this scale have yielded acceptable internal reliability (α = 0,96 - excluding item 26; Pimenta, Leal, Maroco, & Rosa, 2012). In the current study the Cronbach alpha for the scale was 0,97.

***Eating Disordered Behaviors**

The Eating Disorder Examination Questionnaire (EDE-Q) is a self-reported version of the well-established investigator-based interview Eating Disorder Examination (EDE). Like the EDE, it has a 28-day time frame and it asks directly about the occurrence and frequency of key eating disorder behaviors during the past 4 weeks. Its 28 items are based closely on the corresponding questions from the EDE interview and it uses the same seven-point rating scheme. It contains four subscales: restraint, eating concern, shape concern and weight

concern. It is easy and inexpensive to administer and can quickly measure eating disorders and compensatory behaviors in large samples.

A study from Machado et al. (2014) supports the reliability and clinical usefulness of the Portuguese version of EDE-Q. Its results revealed that the four subscales of the EDE-Q have excellent internal consistency (global score, α = 0.94; restraint, α = 0.79; eating concern, α = 0.72; shape concern, α = 0.90; and weight concern, α = 0.80) (Machado et al., 2014). In this study, Cronbach's alpha was: global score, α = 0,82; restraint, α = 0,78; eating concern, α = 0,81; shape concern, α = 0,84; and weight concern, α = 0,91.

***Psychosocial Impairment**

The Clinical Impairment Assessment (CIA) is a 16-item self-report measure of the severity of psychosocial impairment due to eating disorder features. It focuses on the past 28 days. These 16 items cover impairment in domains of life that are typically affected by eating disorder psychopathology: mood and self-perception, cognitive functioning, interpersonal functioning and work performance (Bohn et al., 2008).

The CIA is designed to be completed immediately after filling in a measure of current eating disorder features that cover the same time frame (e.g. EDE-Q).

In the current study, the internal consistency reliability of this scale was measured with Cronbach's alpha coefficient (α = 0,948).

5. Analyses

SPSS (version 20.0, SPSS inc. IBM® Company) statistical software was used for the analyses. The statistical significance level was $p < 0.05$. Descriptive statistics was used to calculate frequency distributions. ANCOVA analyses were conducted to compare means between groups. In addition, a mediation analysis was performed using PROCESS, model 6, (and add-on from SPSS), to test the hypothesis proposed in the present study.

CHAPTER IV:

RESULTS AND DISCUSSION

1- Results

*Participants' Characteristics

The participants' characteristics (age, marital status, education, length of disease, treatment type, length of treatment and BMI) are shown on Table 10.

Table 10- Participants' characteristics

	Participants	
	(n=50)	**%**
Age (mean)	23,72 (SD= 11,21) Min=14/ Max=61	
Marital Status		
Single	45	90%
Married	2	4%
Unmarried Partners	2	4%
Divorced	1	2%
Education		
Grade School	6	12%
High School	25	50%
Bachelor`s Degree	15	30%
Masters or above	4	8%
Length of Disease	5,5 years (SD=8,65) Min=0,17/ Max=45	
Treatment Type		
Inpatient	8	16%
Outpatient	42	84%
Length of Treatment	2,3 years (SD=3,95) Min=0,1/ Max=25	
BMI	16,9 (SD= 2,35) Min=12,3/ Max=22,9	

The participants' mean age was 23,72 (SD= 11,21/ minimum= 14 years old/ maximum= 61 years old). Respecting marital status, most participants were single (90%). Regarding education, 50% of them had a high school diploma. The average length of disease was 5,5 years (SD=8,65/ minimum= 2 months/ maximum= 45 years). Most patients were outpatients (84%) and almost one third of them (28%) had been sick for one year or less. The mean value for BMI was 16,9 (SD= 2,35/ Min= 12,3/ Max= 22,9).

Following, Table 11 shows the participants' distribution regarding the use of pro-ana websites.

Table 11- Pro-ana website usage

	Pro-Ana Website Usage **YES (N=20)**
Number of pro-ana websites that patients usually visit	
1-2 websites	10 (50%)
3-4 websites	4 (20%)
5 or + websites	1 (5%)
Missing Data	5 (25%)
Reasons to visit pro-ana websites	
To learn new techniques to lose weight	8 (40%)
To seek motivation to lose weight	5 (25%)
To seek emotional support	5 (25%)
To meet people	1 (5%)
To express herself	2 (10%)
Others	2 (10%)

Table 11 shows that 20 patients (40%) affirmed to have visited pro-ana websites. Among these patients, 50% affirmed to visit 1-2 websites pro-ana weekly. Further, the reasons most related to the use of pro-ana websites were: to learn new techniques to lose weight (40%), to seek motivation to lose weight (25%), and to seek emotional support (25%).

***Differences between Usage Groups of Pro-Ana Websites**

We conducted an ANCOVA analysis to find the differences between participants who visit and do not visit pro-ana websites according to the different psychological variables (dependent variables). After controlling for the effect of age, BMI, length of disease and length of treatment, we found the following results (Table 12).

Table 12- Results for the effect of website usage on dependent variables

Dependent Variable	Mean (SE)	F	p-value
BSQ- Body Dissatisfaction			
No	2.94 (.220)	6.29	.017
Yes	3.83 (.272)		
RSES- Self-Esteem			
No	1.39 (.122)	2.45	.125
Yes	1.09 (.151)		
WHOQOL-BREF- Quality of Life			
No	3.29 (.110)	3.04	.089
Yes	2.98 (.136)		
CIA- Psychosocial Impairment			
No	1.38 (.125)	13.437	.001
Yes	2.11 (.155)		
EDE-Q (Total Score)- Eating Disorder Behaviors			
No	2.75 (.263)	10.187	.003
Yes	4.10 (.326)		

EDE-Q- Eating Disorder Behaviors (Dietary Restraint)			
No	2.38 (.300)	3.64	.064
Yes	3.30 (.372)		
EDE-Q- Eating Disorder Behaviors (Weight Concern)			
No	2.96 (.310)	9.11	.005
Yes	4.46 (.384)		
EDE-Q- Eating Disorder Behaviors (Shape Concern)			
No	3.44 (.323)	7.60	.009
Yes	4.87 (.400)		
EDE-Q- Eating Disorder Behaviors (Eating Concern)			
No	2.23 (.280)	11.799	.001
Yes	3.77 (.347)		

Results showed that body dissatisfaction (p = .017), psychosocial impairment (p = .001), eating disordered behaviors (total) (p = .003), weight concern (p = .005), shape concern (p = .009) and eating concern (p = .001) means were significantly higher for patients who visit pro-ana websites compared to patients who do not visit it. The dietary restraint mean was marginally significantly higher (p = .064) for patients who visit pro-ana websites compared to patients who do not visit it. On the other hand, the quality of life mean was marginally significantly higher (p = .089) for patients who do not visit pro-ana websites compared to patients who visit it. The self-esteem mean difference between the 2 groups of patients was not significant (p = .125).

***Hypothesis Test**

To test the proposed model (see Figure 2) we conducted a bootstrap mediation analysis using PROCESS, model 6 (Hayes, 2013) with 10,000 resamples. The dietary restraint variable was tested according to the dietary restraint subscale from the EDE-Q.

Results from the mediation analysis revealed that: (1) **pro-ana website usage** is positively associated with **dietary restraint** (β = .91, SE =.50, t = 1.80, p = .07); (2) **dietary restraint** is positively associated with **body dissatisfaction** (β = .44, SE = .09, t = 4.9, p < .001); (3) **body dissatisfaction** is negatively associated with **self-esteem** (β = -.42, SE = .09 , t = -4.7 , p < .001); and (4) **self-esteem** is positively associated with **quality of life** (β = .56, SE = .12, t = 4.6, p < .001). This analysis was performed controlling for the following variables: age, BMI, length of disease and length of treatment.

Following, we specified each direct and indirect effects:

(1)- The direct effect of **pro-ana website usage** on **quality of life** is not statistically significant (β = -.04, SE = .14, t = -.31, p = .75). In other words, the direct effect of **pro-ana website usage** on **quality of life** without passing through either variables (**dietary restraint**, **body dissatisfaction** and **self-esteem**) has no significance when those 3 variables are in the mediation analysis.

(2)- The first indirect effect (Ind1) is the specific indirect effect of **pro-ana website usage** on **quality of life** through only **dietary restraint** (**Pro-Ana Website Usage → Dietary Restraint → Quality of Life**). However, this path of influence is not significant. It cannot be claimed as significant because the bootstrap confidence interval straddles zero (CI (95%) = -.0833, .1258).

(3)- The second indirect effect (Ind2) is the specific indirect effect of **pro-ana website usage** on **quality of life** through **dietary restraint** and **body dissatisfaction** (**Pro-Ana Website Usage → Dietary Restraint → Body Dissatisfaction → Quality of Life**). Although, this path of influence is not significant (CI (95%) = -.2123, .0068).

(3)- The third indirect effect (Ind3) is the specific indirect effect of **pro-ana website usage** on **quality of life** through **dietary restraint** and **self-esteem** (**Pro-Ana Website Usage → Dietary Restraint → Self-Esteem → Quality of Life**). However, this path of influence is not significant (CI (95%) = -.0403, .1406).

(4)- The fourth indirect effect (Ind4) is the specific indirect effect of **pro-ana website usage** on **quality of life** through **dietary restraint**, **body dissatisfaction** and **self-esteem** (**Pro-Ana Website Usage → Dietary Restraint → Body Dissatisfaction → Self-Esteem → Quality of Life**). A bias-corrected bootstrap confidence interval for the indirect effect was

entirely under zero (CI (95%) = -.3124, -.0145). It means that the specific indirect effect 4 is significant, supporting hypothesis 1 (**H1**).

(5)- The fifth indirect effect (Ind5) is the specific indirect effect of **pro-ana website usage** on **quality of life** through only **body satisfaction** (**Pro-Ana Website Usage → Body Satisfaction → Quality of Life**). However, this path of influence is not significant (CI (95%) = -.2392, .0249).

(6)- The sixth indirect effect (Ind6) is the specific indirect effect of **pro-ana website usage** on **quality of life** through **body satisfaction** and **self-esteem** (**Pro-Ana Website Usage → Body Satisfaction → Self-Esteem → Quality of Life**). Although, this path of influence is not significant (CI (95%) = -.3341, .0207).

(7) The seventh indirect effect (Ind7) is the specific indirect effect of **pro-ana website usage** on **quality of life** through only **self-esteem** (**Pro-Ana Website Usage → Self-Esteem → Quality of Life**). However, this path of influence is not significant (CI (95%) = -.1621, .2282).

In sum, consistent with the hypothesized model (Figure 2), results showed that the indirect effect of **pro-ana website usage** on **quality of life** via **dietary restraint**, **body dissatisfaction** and **self-esteem** was significant (indirect effect 4: β = -.09, SE = .06, CI (95%) = -.3124, -.0145).

We follow our results with a discussion of this work contributions and limitations, as well as promising avenues for future investigations.

2- Discussion

To our knowledge, this work is the first to empirically demonstrate the significance and implications of pro-ana website usage on the quality of life of anorexic patients. Even though it has been said that the use of pro-ana websites tends to negatively affect the quality of life of visitors (Peebles et al., 2012), no other studies have so far investigated the other variables associated with this process. The goal of this section is to present the theoretical arguments that support the hypothesis of this dissertation's model.

It is known that pro-ana websites promote anorexia nervosa as a lifestyle rather than a disease (Peebles et al., 2012). Regarding the motivations related to the use of pro-ana websites, our results showed that many participants visit these websites to learn new techniques to lose weight and to seek emotional support (see Table 11). The reviewed literature soundly supports our results. According Rich (2006), on pro-ana websites, anorexia is the synonym of thinness and achievement. Therefore, many visitors visit these websites looking for new ways to lose weight and be successful/thin. Besides that, visitors consider pro-ana websites “safe heavens”- a place to connect with others who have similar problems and philosophies (Schutz & Paxton, 2007). Consequently, socially isolated or stigmatized individuals visit pro-ana websites to share their experiences with a sense of personal safety and community support (Dolan, 2003; Mulveen & Hepworth, 2006).

Results displayed on Table 12 show that body dissatisfaction, psychosocial impairment and eating disordered behaviors (dietary restraint, weight concern, shape concern and eating concern) levels were higher for patients who visit pro-ana websites compared to patients who do not visit it. Consistent with our results, recent investigations have found support to the fact that visiting pro-ED websites is related to significantly higher levels of body dissatisfaction than visiting pro-recovery websites (Harper et al., 2008). One possible explanation is that some websites host competitions to find the “best anorexic” or the “Ana of the month” (Rich, 2006) by posting pictures of extremely thin women. It is known that the exhibition of these type of images is a powerful influential factor that contributes to body dissatisfaction in Western society (Borzekowski & Bayer, 2005; Groesz et al., 2002).

Regarding psychosocial impairment, it is known that eating disorders have a profound and highly specific impact on it. Psychosocial impairment can be extremely disabling. It can affect the person’s mood, cognitive function, family relationships, as well as their ability to be

with others and to form intimate personal relationships (Bohn et al., 2008). Therefore, it is important to notice that our results showed that anorexic patients who visit pro-ana websites have even higher levels of psychosocial impairment. It supports the evidence that pro-ana websites are very harmful.

Consistent with our results, Wilson et al. (2006) affirmed that the use of pro-ana websites is a likely mechanism of worsening eating disorders among visitors. Researchers affirm that it may intensify the sense of anorexia as an identity, particularly through the normalization of pathological cognitions, emotions, and behaviors. (Gavin et al., 2008; Giles, 2006; Lyons et al., 2006; Tierney, 2006). Further, it encourages and reinforces disordered eating behaviors like dietary restraint. Rich (2006) affirms that competitions among anorexic individuals leads to increase in dangerous behaviors (e.g. extreme dietary restraint). Another study investigated the influence of exposure to pro-ED websites on college women eating behaviors. It found that those who viewed a pro-ana website significantly decreased their caloric intake over the one week period between pre and post-website exposure (Jett et al., 2010).

Results from our study (see Table 12) also show that quality of life was lower for patients who visit pro-ana websites compared to patients who do not visit it. These results reinforce the reviewed literature. A recent study that verified the correlation between the use of pro-ED websites and quality of life showed a clear association between the level of pro-ED website usage and low quality of life (Peebles et al., 2012).

Regarding self-esteem, our results showed no significant difference between the 2 groups of patients (patients who visit pro-ana websites and patients who do not visit it) (see Table 12). On the other hand, and contrary to our results, the reviewed literature indicated that women who viewed pro-ana websites decreased in self-esteem (Bardone-Cone & Cass, 2006; Bardone-Cone & Cass, 2007). A study from these same authors revealed that participants exposed to a prototypic pro-ana site had greater negative affect and lower social self-esteem than those who viewed comparison websites.

After testing our hypothesis, findings suggest that the direct effect of **pro-ana website usage** on **quality of life** without passing through either variables (**dietary restraint**, **body dissatisfaction** and **self-esteem**) has no significance when those variables are in the mediation analysis. This somewhat unexpected event can be explained by the fact that mediation analysis does not impose simple association (direct effect) as a precondition (Hayes,

2013). The fact that the direct effect is not significant in the mediation analysis means that the effect of pro-ana website usage on quality of life passes completely through dietary restraint, body dissatisfaction and self-esteem. It confirms our hypothesis (H1). In other words, this study identified a path of influence— the indirect effect of **pro-ana website usage** on **quality of life** via **dietary restraint**, **body dissatisfaction** and **self-esteem**. Hence, these results provide support to the proposed model (Figure 2).

This study has some limitations. Specifically, the homogenous nature of its sample (Portuguese female participants) calls for cautious generalizations. In addition, the population size was recognized as another limitation; even though the study population was large enough to produce significant results, differences between subgroups of participants were hard to find. Further, the population was exclusively composed by anorexic patients (clinical population). Moreover, it was not possible to collect data about the usage frequency of pro-ana websites. Therefore, we could not investigate the associations between quality of life of visitors and usage frequency of pro-ana websites. It would have been essential to test if there is difference not only between groups (patients who visit pro-ana websites and patients who do not visit it) but also between subgroups (light users and heavy users).

CHAPTER V:

CONCLUSION

Recent studies have called our attention to the existence of pro-ana websites and its growing popularity (Bardone-Cone & Cass, 2006; Delforterie et al., 2014; Jett et al., 2010; Peebles et al., 2012; Wilson et al., 2006). The present study provides evidence that the use of pro-ana websites may be highly harmful.

Our findings suggest that the use of pro-ana websites is related to higher levels of body dissatisfaction, psychosocial impairment and eating disordered behaviors (dietary restraint, weight concern, shape concern and eating concern). In addition, our results showed that patients who visit pro-ana websites have lower levels of quality of life compared to patients who do not visit it.

The hypothesized model was supported by our findings, which shows that the **use of pro-ana websites** is positively associated with **dietary restraint**, which is positively associated with **body dissatisfaction**, which in turn is negatively associated with **self-esteem**, which is positively associated with **quality of life**.

Perhaps, the most significant contribution of this study is the proposition of a new significant model that shows a path of influence (**Pro-Ana Website Usage → Dietary Restraint → Body Dissatisfaction → Self-Esteem → Quality of Life**). However, I do not claim that this is the only possible path of influence. There may be other variables associated with this process that we have not tested on our study.

The knowledge generated in this research can help to advance theory. Besides that, it could also guide healthcare professionals on planning the patients' treatment. For example, the use of pro-ana websites should supposedly be addressed in the initial phase of the treatment planning and incorporated in the decision making. For pro-ana website visitors, this work serves an informational purpose, alerting them about the negative effects related to the use of pro-ana websites.

Despite the progress in this paper, there is room for future work accounting for a longitudinal design to investigate if the variables tested in our study are mediators of the effect of pro-ana website usage on quality of life. Also, to establish causality, since this study can not identify whether the most vulnerable individuals are the ones who choose to visit these websites or if those websites are the cause to such vulnerabilities (body dissatisfaction, low self-esteem and eating disordered behaviors). Another possible mechanism is perfectionism. Researchers

have found that higher levels of perfectionism are linked to the use of pro-ana websites (Bardone-Cone & Cass, 2007; Custers & Van den Bulck, 2009). Future studies could also take into account different groups of visitors (heavy users and light users) to test if their quality of life varies according to the number of hours they spend on pro-ana websites. Further, they could investigate whether the use of pro-ana websites affects visitors in ways beyond quality of life—for example, by influencing their length of treatment.

In light of the discussion in the previous paragraphs, however, it is indisputable that many questions remain unanswered and that the future is likely to bring us many interesting works in this important area.

CHAPTER VI:

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